

This paper is work in progress. Please do not cite or quote. Comments welcome.

## **SOCIAL CLASS, LIFE CHANCES AND VULNERABILITY TO POVERTY IN SOUTH AFRICA**

By Simone Schotte<sup>a,b\*</sup>, Rocco Zizzamia<sup>b,c</sup> and Murray Leibbrandt<sup>b</sup>

January 2017

<sup>a</sup> *University of Göttingen and GIGA German Institute of Global and Area Studies, Germany*

<sup>b</sup> *Southern Africa Labour and Development Research Unit (SALDRU), University of Cape Town, South Africa*

<sup>c</sup> *Department of International Development, University of Oxford, UK*

### **ABSTRACT**

The wave of upbeat stories on the developing world's emerging middle class has reinvigorated a debate on how social class in general and the middle class in particular ought to be defined and empirically measured. The contribution this paper makes to this literature is both conceptual and empirical. The conceptual contribution consists in proposing a class schema with particular relevance for the emerging and developing country context marked by high economic insecurity. Building on a recently developed framework that defines the middle class in relation to their (in)vulnerability to poverty, in this paper, we propose a multi-layered class model that differentiates five social classes: (i) the chronic poor, characterised by high poverty persistence, (ii) the transient poor, who have above average chances of escaping poverty, (iii) the non-poor but vulnerable, whose basic needs are currently being met but who face above average risks of slipping into poverty, (iv) the middle class, who are in a better position to maintain a non-poor standard of living even in the event of negative shocks, and (v) the elite, whose living standards situate them far above the average. The empirical contribution consists in the application of this conceptual innovation to the South African case using a model of poverty transitions that is fitted to four waves of panel data from the National Income Dynamics Study (NIDS) covering 2008 through to 2014/15. Given the classification derived in this paper, we find that only about 20 per cent of the South African population can be considered as stably middle class. Africans remain underrepresented in the middle class, and race is still one of the strongest predictors of poverty in South Africa. Members of larger, female headed, or rural households face a higher risk of poverty, and are less likely to enter the ranks of the middle class. Having access to stable labour market income, by contrast, is a key determinant for households to achieve economic stability in South Africa. Improving the access to insurance and credit instruments can importantly help households to sustain their living standards over time.

**Keywords:** South Africa; social class; poverty dynamics; vulnerability

**JEL Classification:** D31, I32, C32, C35

---

\* Correspondence to: Simone Schotte, GIGA Institut für Afrika-Studien, Neuer Jungfernstieg 21, 20354 Hamburg, Germany. E-mail: simone.schotte@giga-hamburg.de

The authors are grateful to Francois Bourguignon, Stephan Klasen, Denis Cogneau, Jann Lay, Lena Giesbert, Arden Finn, Ingrid Woolard, and Martin Wittenberg for helpful suggestions. Responsibility for the content of the paper remains with the authors.

## 1. Introduction

What makes the middle class? While seemingly countless interpretations exist, most definitions of what constitutes the middle class somehow relate to the degree of economic security and self-sufficiency that people experience. There is a common understanding that being middle class entails being free from poverty, which means being able to afford the basic things in life – not only today, but also tomorrow. It is actually this very confidence which many people will name first when being asked what makes them self-identify as middle class.<sup>2</sup> It is about the freedom they have to decide what to spend their money on, and the stability needed to engage in mid- and long-term planning. It is also about the opportunities they are given to move ahead in life, which some people never get, and about the financial cushion that allows them to take risks and to cope with adverse shocks.<sup>3</sup>

This understanding of the middle class as an ‘empowered’ and economically secure part of society is indeed inherent to many of the expectations commonly placed into this class’s role in politics and economic development. Besides its purchasing power and potential to boost domestic consumption, the list of favourable value orientations often ascribed to the middle class is long. It includes traits such as a commitment to saving and investment, a belief in meritocracy, entrepreneurial spirit and the importance attached to education (Cárdenas et al. 2011). Broadly, in the tradition of modernisation theory, a sizeable and well-established middle class has been associated with a shift in public priorities away from a focus on ‘basic needs’ towards so-called ‘higher order’ goods, which may benefit the creation and consolidation of good institutions in general and democratic rule in particular (Inglehart 1990, Easterly 2001, Birdsall 2010). Sharply lower levels of economic scarcity and physiological insecurity are indispensable prerequisites – albeit no guarantees – for the middle class to live up to these ascribed tasks.

In face of the ambitious hopes invested in the middle class as torchbearers of both democracy and long-term economic growth, it is little wonder that upbeat stories about a rapidly expanding new middle class in Africa (AfDB 2011) have been excitedly embraced by the business community, policymakers and the media alike (Giesbert and Schotte 2016). However, much of this enthusiasm depends crucially upon the exact way in which the middle class is identified. It may surprise that in spite of a considerable body of research highlighting the dynamic nature of poverty (see, e.g., Dercon, 2006; Klasen and Waibel, 2012), more than a few studies in the economics literature statically locate the middle class just above the poverty line (for an extensive review of different approaches, see Zizzamia et al., 2016). It is widely acknowledged that being able to afford a certain basket of goods at a given point in time does not in itself give any indication whether the same will be true in the near future, and even those who are currently non-poor may face a non-negligible risk of falling into poverty. Similarly, not all households below the poverty line are alike. Poverty tends to be self-perpetuating, but while some households may have always been poor, others may have suffered some negative financial shock that only temporarily pushed them into poverty (Glewwe and Gibson, 2006).

---

<sup>2</sup> See Phadi and Ceruti (2011) for a sociological study interviewing 2559 residents of Soweto. While interpretations of what constituted ‘basic goods or needs’ differed considerably, the notion of economic security was pervasive amongst the heterogeneous group which self-identified as middle class.

<sup>3</sup> Evidence from the psychological and health literature has shown that vulnerability to poverty can reduce the well-being of households, even if a deterioration in material well-being does not materialise (Cafiero & Vakis, 2006). It is not only current income or consumption that matter for actual welfare, “but also the risks a household faces, as well as its (in)ability to prevent, mitigate and cope with these” (Klasen & Waibel, 2012: 17).

One may argue that there is an inherent tension between the study of social stratification, which assumes the persistence and continuity of an existing pattern of social stratification over time, and the dynamic study of poverty (Vandecasteele, 2015). However, in this paper we aim to reconcile these two perspectives. We link the demarcation of social strata to an in-depth analysis of poverty transitions using a first order Markov model (Cappellari and Jenkins 2002, 2004, 2008). This model – which accounts for endogenous initial conditions, unobserved heterogeneity, and non-random panel attrition – is fitted to four waves of panel data from the South African National Income Dynamics Study (NIDS) covering the period from 2008 to 2014/15. While we cannot adequately determine a person’s life chances based on current income or consumption levels exclusively, our estimates indicate that traditional social stratification variables (such as education and occupation) as well as demographic characteristics (such as race, gender, and household composition) are important predictors of the risks and opportunities someone faces. Based on these characteristics, for each household we can predict the likelihood of poverty entry and exit. We use these propensities in combination with the material well-being at present to group the South African society into five social strata, namely: (i) the chronically poor, characterized by high poverty persistence, (ii) the transient poor, who are presently poor but have above average chances of escaping poverty, (iii) the non-poor but vulnerable, who see their basic needs currently being met but face above average risks of slipping into poverty, (iv) the middle class, who are in a better position to secure their position against negative events, and (v) the elite, with living standards way above the average.

In doing so, the contribution this paper makes is both conceptual and empirical. The conceptual contribution consists in proposing a class schema with particular relevance for the emerging and developing country context marked by high economic insecurity. The empirical contribution consists in the application of the conceptual innovation to the South African case using recently available nationally representative panel data that allows the identification of key determinants of class and mobility patterns. While the distinction between the stable middle class and a more vulnerable group is not novel (the approach pioneered by López-Calva and Ortiz-Juarez (2014) has inspired a number of studies, increasingly relying on pseudo panel data), to our knowledge, this paper is the first that incorporates this differentiation into a social stratification schema that additionally differentiates between transient and chronic poverty. In addition, unlike López-Calva and Ortiz-Juarez’s model (and recent replications) we move away from using exclusively income or consumption thresholds to define class boundaries and instead propose probability cut-offs. This way, our approach captures both the risk to enter and the opportunity to exit poverty as important dimensions that shape someone’s life chances. The poverty transitions model we use (following Cappellari and Jenkins 2002, 2004, 2008), moreover takes the initial poverty status explicitly into account. This is important in presence of state dependence, which has been ignored by existing vulnerability-based approaches to studying the middle class.

The remainder of this paper is structured as follows: In Section 2 we briefly summarize the major paradigms of class theories, paying particular attention to the role played by mobility patterns and the Weberian concept of ‘life chances’. We then review a wide array of existing empirical approaches to defining the middle class in their strengths and limitations. In Section 3, which constitutes the main contribution of this paper, we develop our schema of social stratification based on a model of poverty transitions. Section 4 profiles the five identified social groups in South Africa in terms of their relative size, growth, racial composition and other demographic characteristics, geographic location, labour market resources, and mobility patterns. Section 5 concludes.

## 2. Enduring social inequality versus social mobility in class analysis

Theories of class and social stratification generally seek to account for patterns of systematised and enduring social inequality, understood as a condition whereby actors have unequal access to desired (economic or non-economic) resources (Arthur, 2014; Southall, 2016; Vandecasteele, 2015). Despite this common ground, it is widely acknowledged that class remains a contested concept with multiple definitions, understandings, and applications (see *inter alia* Burger et al., 2014; Southall, 2016; Zizzamia et al., 2016 for an overview). In what follows, we review some of the key approaches to class from the theoretical and empirical literature in social science, with a focus on the interrelationship between class and social mobility.

The conceptual roots of most class analyses can be traced back to the writings of Karl Marx and Max Weber. The Marxian approach defined class in terms the ownership of the means of production, presuming constant struggle between those who own and control the means of production (the capitalist class or “bourgeoisie”), and those who own nothing but their labour power, which they sell in return for wages (the working class or “proletariat”). While it is often asserted that the middle class for Marx was merely a transitional class, he was well aware that there could be individual movement (“social mobility”) between the two great classes he theorized. In other words, capitalists could be driven out of business and into poverty or wage labour by competition, just as members of the working class could raise capital, create their own successful businesses and grow rich. However, for Marx these individual movements were limited and with negligible consequences for the underlying class schema that only a radical revolution could change.

Unlike Marx, Weber believed that political and economic advancement of the working class was possible within capitalism. He bridged the gap between the two major classes in society by interposing a continuum of groups whose positions were determined not only by property ownership (or the lack of it), but also by other factors that determine someone’s life-time opportunities, such as “income, security of employment, promotion opportunities, long-term income prospects and the general array of social and material advantages that Weber referred to as person’s market position or ‘life chances’.” (Southall 2016: 6). This perspective has triggered an important interest in the interrelationship between class and economic (in)security or vulnerability.

Located in the neo-Weberian line of thought, in the sociological literature there is a well-established tradition of class and social mobility research that draws on Goldthorpe’s Schema developed in the early 1970s for modern Britain and since widely applied throughout Europe, Australasia, and North America (see Goldthorpe, 2000 for a detailed presentation).<sup>4</sup> The schema comprises seven occupational categories, ranked by type of tasks and skill levels, whose members should typically be comparable in terms of their “levels of income, their degree of economic security and chances of economic advancement [market situation]; [...] [as well as] their degree of autonomy in performing their work-tasks and roles [work situation]” (Goldthorpe 1980: 39). Given this understanding, growing flexibility and precariousness in the labour market – increasingly characterised by temporary or zero-hour contracts and part-time work – caused some to announce the ‘death of class’ in industrialised and post-industrial nations (Beck, 1992; Clark and Lipset, 1991). Yet, while risks may have become

---

<sup>4</sup> Goldthorpe Schema: (i) professional, administrative and managerial employees, higher grade; (ii) professional, administrative and managerial employees, lower grade; technicians, higher grade; (iii) routine non-manual employees, higher grade; (iv) small employers and self-employed workers; (v) supervisors of manual workers; technicians, lower grade; (vi) skilled manual workers; (vii) semi- and unskilled manual workers.

less predictable, other studies have found that social class and life course events remain important determinants of the distribution of risks in a society (Di Prete, 2002). In spite of yet higher levels of economic insecurity (ILO, 2004), several authors have proposed similar occupation-based approaches for the specific South African context (see, e.g., Crankshaw, 1997; Garcia-Rivero et al., 2003; Seekings and Natrass, 2005). Among these, the class schema suggested by Southall (2016), developed for the specific case of South Africa, additionally differentiates between employment in the private and public sector as two distinct sources of economic and political power. Yet, all these occupation-based approaches have the important disadvantage of creating a very heterogeneous “residual” group of households representing over one-third of the South African population that cannot be classified, including “unemployed people [about 36.3 percent of those in working age were either unemployed or desiring work but not actively searching for a job in 2016 (StatsSA, 2016)] dependent upon government grants through to a relatively small number of people enjoying a prosperous retirement funded by pensions and investments” (Southall, 2016: 55).

Visagie and Posel (2014) circumvent this problem by using a much less fine-grained three-tier class schema, where South Africa’s “affluent” middle class is located in an income range (R1,400 to R10,000 per person per month in 2008 prices) equivalent to the expected income for households where the highest income earner is in an occupation that has typically been associated with the middle class.<sup>5</sup> Households with incomes below or above this range are respectively considered as lower or upper class. The authors contrast this conceptualisation with a relative definition that identifies the middle class as those in the “literal” middle of the national income distribution (the three middle quintiles as suggested by Easterly, 2001 and Solimano, 2008 in cross-national studies; similar measures had been suggested by Levy et al., 2014 and Finn et al., 2013 for South Africa specifically). While the latter can be useful to assess progress at the median and the inclusiveness of economic growth, the authors argue that the affluence measure captures “those in society who have achieved a standard of living associated with economic stability and prosperity” and is thus more appropriate to assess the “racial transformation in opportunities and access to resources” (Visagie and Posel, 2014: 166). Other scholars focusing on the emerging and developing countries context, similarly argued that those in the actual middle will likely still be poor in absolute terms and are “unlikely to be the middle class as either historically defined or understood” (Bhalla 2007, p. 94).

This spurred a focus on absolute approaches to defining the middle class in the development economics literature, where a heated debate has emerged especially regarding the lower cut-off point that separates the poor from the middle class. The important decision researchers are confronted with is whether the middle class starts just where poverty ends (Banerjee and Duflo, 2008; Ravallion, 2010), or whether there should be some intermediate group that separates those who can satisfy their most basic needs (but remain on the verge of falling into poverty) from a more economically stable middle class (AfDB, 2011). Arguing in favour of the latter, López-Calva and Ortiz-Juarez (2014) proposed an approach to defining the middle class anchored in the notion of economic security. Using panel data from Chile, Mexico, and Peru, households are ranked by their estimated probability of remaining in or falling into poverty over a five year horizon. They find that a minimum income level of \$10 a day (in 2005 PPPs) is required for households to face a maximum risk to

---

<sup>5</sup> Middle class occupations include white collar professions such as managers, senior officials, legislators, professionals (e.g. teachers and nurses), associate professionals, technicians and clerks; whereas working class occupations would include plant and machinery operators, craft and related trade workers, skilled agriculture and fishery workers, service and market sales workers and all elementary occupations (Visagie, 2013a).

poverty of 10 per cent, which they consider the maximum acceptable degree of vulnerability for being considered middle class. The upper cut-off is (arbitrarily) fixed at \$50 a day (in 2005 PPPs). Replicating the approach for South Africa, Zizzamia et al. (2016) locate the country's middle class in an expenditure range of R3,104 to R10,387 (in January 2015 prices), equivalent to about \$13 to \$43.3 a day (in 2005 PPPs), which overlaps with Visagie and Posel's (2014) affluence-based middle class definition.

The vulnerability approach to defining the middle class as pioneered by López-Calva and Ortiz-Juarez (2014) has the advantage that the underlying estimation of risks to poverty allows incorporating a variety of factors that tend to affect a household's economic stability. In addition, the household head's education and sector of occupation, the household's geographic location, housing conditions, demographic composition, and health situation are also taken into account. However, it is assumed that all these criteria can ultimately be adequately summarised in an absolute income threshold. By making this simplifying assumption, the approach ignores that households with the same current level of income can diverge substantially in their characteristics and associated poverty risks. A similar critique applies to Visagie and Posel's (2014) affluence-thresholds. There is no guarantee that the household that falls within the defined income bands actually derive their income from the (relatively stable) occupations that have typically been associated with the middle class (Southall, 2016).

In contrast to the approaches that focus on education and occupation as key determinants of income generation, others suggest using asset indices to proxy for both current household wealth and the ability to cope with negative economic shocks (see Udjo, 2008 for an application using categories from the South African Advertising Research Foundation's Living Standard Measure). Exceptionally comprehensive in this regard is the study conducted by McEwan et al. (2015), who employ a multidimensional indicator of social class that defines 10 groups according to 29 indicators of living standards in South Africa (including asset ownership, race, and degree of urbanisation, amongst others). Despite providing a comprehensive understanding of the standard of living of those in the middle class, these approaches have the shortcoming that they remain silent on the sources of wealth as they give no indication where the assets originally came from or how there were financed. Burger et al. (2015) partly overcome this shortcoming by proposing a combined multi-dimensional approach that closely builds on Sen's capability approach. They identify four capabilities considered essential to capture the middle class as an "empowered, capacitated and economically secure" class (Burger et al., 2015: 2).<sup>6</sup> However, the functionings used to operationalise these core capabilities tend to capture very basic needs rather than a situation of economic empowerment: (i) adequate sanitation and clean water, (ii) ownership of a stove and fridge, (iii) at least one employed member of the household, and (iv) TV and radio ownership, and literacy. Consequently, much of the substantial growth they observe in the middle class is likely due to the considerable expansion of government service provision over the past two decades. Another disadvantage of the approach is that it does not lend itself to the identification of an elite, which would seem particularly relevant in the South African context marked by high income and wealth concentration at the very top of the distribution (see Zizzamia et al., 2016).

---

<sup>6</sup> Sen defines capabilities as "substantive freedoms [one] enjoys to lead the kind of life he or she has reason to value", where income is only instrumentally valuable insofar as it expands capabilities (1999: 87). The four core capabilities Burger et al. (2015) define for being considered middle class include: (i) freedom from concern about survival and meeting basic needs, (ii) financial discretion and buying power, (iii) labour market power, and (iv) access to information and the ability to process information.

Given these shortcomings, the need for an empirically and theoretically rigorous definition of the South African middle class remains evident. Building on the idea that members of the same class should share common life chances, Schotte (2016) has recently suggested another multidimensional approach that combines a living standard measure to approximate objective wealth with a measure of subjective well-being and a measure of perceived chances for social upward mobility. In the present paper, we build on this and other preceding work (López-Calva and Ortiz-Juarez, 2014; Zizzamia et al., 2016) by taking on a dynamic perspective that not only accounts for households' current capacity to satisfy basic needs, but also their potential of doing so in the future.

### 3. A model of multi-layered social classes in South Africa

In what follows, we propose a multi-layered class schema for South Africa (see Figure 1), which takes expected upward and downward mobility and particularly vulnerability to poverty explicitly into account. The five defined classes diverge both in their absolute average standard of living and their risk of remaining in or falling into poverty.

We begin by assuming a standard division of society into three main classes: the poor or the lower class, the middle class, and the elite or the upper class. We understand the poor as those who are in an economically precarious situation in the present period, which does not allow them to satisfy their basic needs. In other words, the poor are those who fall below some commodity-based poverty line reflecting the average estimated cost of a consumption basket that is deemed to be adequate, with respect to both food and non-food components (see section 3.2 for details on the definition of the poverty line). Similarly, we understand the elite as those in society who enjoy a standard of living well above the national average (we arbitrarily fix the elite-threshold at two standard deviations above the average per capita household expenditure in our data).<sup>7</sup>

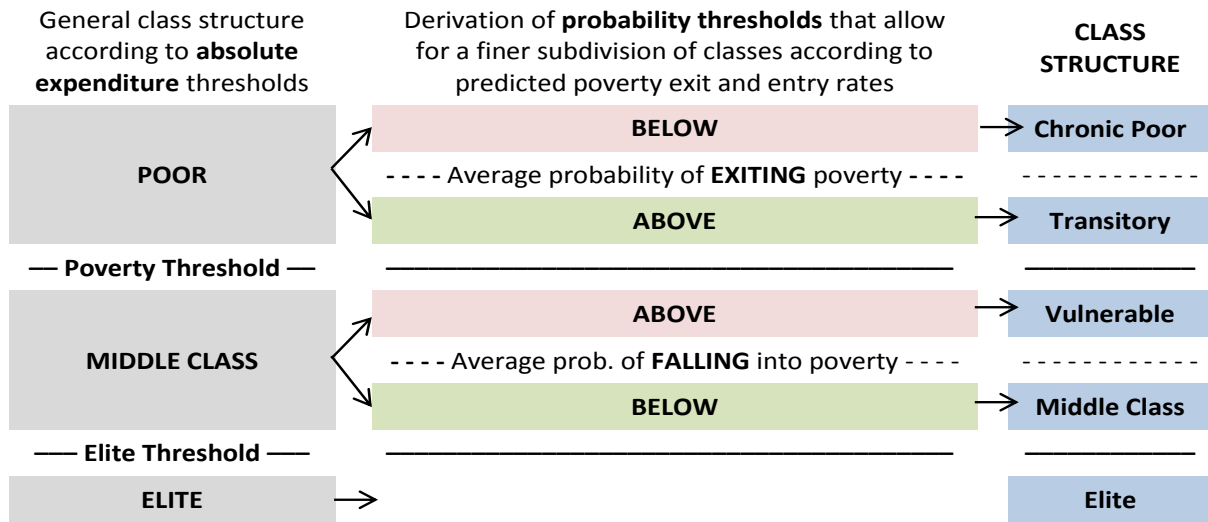
Taking on a dynamic perspective, we introduce two further sublayers (see Figure 1) that conceptually follow a similar idea as Sen's capability approach to well-being (Sen 1993) or the Weberian concept of shared 'life chances' (1968). Based on our model of poverty transitions presented below, for each person we can predict the propensity to remain in or fall into poverty within a two-year time horizon – conditional on the household characteristics and the observed poverty status at present. We believe that these forward looking scores provide a more comprehensive understanding of a person's (medium term) welfare prospects, than what we could gain by focusing on reported expenditure levels exclusively. Based on these latent poverty propensities, we distinguish those with chances of exiting poverty below the observed average exit rate and thus comparatively high risk of poverty persistence – the *chronically poor* – from those with above average chances of making it out of poverty – the *transient poor*.<sup>8</sup> Analogously, among the ones currently above the poverty line, we distinguish those who face an above average risk of slipping into poverty – the *vulnerable* – from the more secure 'actual' *middle class* with a risk to entering poverty below the observed average entry rate and thus better chances to sustain a living above subsistence.

---

<sup>7</sup> The definition of the upper- or elite-threshold is not the focus of this paper. The size of the middle class can be expected to be relatively robust to minor variations in this threshold, given that it lies in the upper tail of the distribution. However, while we consider the exact cut-off point to be less of a concern, we believe the definition of an elite to be particularly relevant in the South African context, marked by an outstanding concentration of wealth at the top of the distribution, particularly in the top quintile (see Zizzamia et al., 2016).

<sup>8</sup> Note that the extent of chronic poverty according to this relative, forward looking definition will be about five percentage points lower than what standard measures of chronic poverty – such as the *spells* (see, e.g., Bane and Ellwood, 1986) or the *components approach* (see Jalan and Ravallion, 1998) – suggest for South Africa.

**Figure 1: Schema of social stratification based on current living standards and mobility patterns**



Source: Authors' representation.

Note: Solid lines denote absolute expenditure thresholds. Dashed lines denote probability thresholds.

### 3.1 Modelling poverty entry and exit probabilities

We examine the determinants of transitions into and out of poverty following an approach developed by Cappellari and Jenkins (2002, 2004, and 2008) drawing on Stewart and Staffield (1999). In order to simultaneously account for initial condition effects, unobserved heterogeneity, and non-random panel attrition, the authors suggest using a multivariate probit model that jointly estimates a system of three equations, including (1) a first-order Markov process of poverty transitions between two consecutive panel waves,  $t - 1$  and  $t$ , (2) the poverty status at  $t - 1$  (in order to account for potential endogeneity of initial conditions), and (3) an equation for sample retention (to consider potential non-random attrition), allowing free correlation between the unobservables affecting each of these three processes.<sup>9</sup> By specifying the current poverty status to be a function of the realised discrete poverty outcome in the last period (following a standard approach pioneered by Heckman, 1981b), we allow the impact of the variables that explain current poverty to vary conditional on whether the individual or household was initially poor or not. This way, the specification provides estimates for both poverty persistence and entry rates.

For each individual,  $i = 1, \dots, N$ , define  $P_{it}$  and  $P_{it-1}$  to be binary variables summarising the individual's poverty status at time  $t$  and  $t - 1$  respectively (measured at the household level), equal to one if  $i$  is poor and zero otherwise. Let  $R_{it}$  be a binary variable summarising panel retention, taking

<sup>9</sup> Controlling for the observed and unobserved determinants of initial poverty status is important in presence of state dependence; this is, if there are reasons to believe that households who have experienced poverty in the past face a higher risk to experience poverty in the future (Heckman 1981a) – for example due to a poverty- or risk-related change in behaviour, constraints relevant for future choices, the depreciation of human capital, and alike. The need to control for unobserved heterogeneity in this respect results from the fact that individuals or households with more favourable characteristics will tend to leave poverty earlier (Heckman 1981a). In practice, the initial poverty status can hardly be considered exogenous. In other words, those who are observed to be poor in the first wave of data tend to be a non-random sample of the population, given that individuals with a higher tendency to remain permanently poor are likely to be overrepresented in the sample (Cappellari and Jenkins 2004; 2008). In addition, endogenous selection may occur with regard to the subsample of individuals for whom the poverty status is observed at two consecutive points in time.



a value of one if  $i$  is observed at both  $t - 1$  and  $t$ , and zero if only observed at  $t - 1$  (i.e. if  $i$  attrited from the sample). For each pair of consecutive waves, individuals can be characterized by the latent poverty propensities  $p_{it}^*$  and  $p_{it-1}^*$ , and a latent propensity of retention  $r_{it}^*$  that take the form:

$$p_{it}^* = [(P_{it-1})\gamma'_1 + (1 - P_{it-1})\gamma'_2]\mathbf{x}_{it-1} + u_{it} \quad \text{with } u_{it} = \mu_i + \delta_{it} \sim N(0,1) \quad (1)$$

$$p_{it-1}^* = \beta' \mathbf{z}_{it-1} + v_{it-1} \quad \text{with } v_{it-1} = o_i + \pi_{it-1} \sim N(0,1) \quad (2)$$

$$r_{it}^* = \psi' \mathbf{w}_{it-1} + \varepsilon_{it} \quad \text{with } \varepsilon_{it} = \eta_i + \xi_{it} \sim N(0,1) \quad (3)$$

and

$$P_{it} = I(p_{it}^* > 0) \quad \text{if } R_{it} = 1; \text{ unobserved otherwise} \quad (4)$$

$$P_{it-1} = I(p_{it-1}^* > 0) \quad (5)$$

$$R_{it} = I(r_{it}^* > 0) \quad (6)$$

where  $\mathbf{x}_{it-1}$ ,  $\mathbf{z}_{it-1}$ , and  $\mathbf{w}_{it-1}$  are vectors of explanatory variables characterising individual  $i$  in her household in terms of base year values,  $\gamma'_1, \gamma'_2, \beta'$  and  $\psi'$  are vectors of parameter, and  $u_{it}, v_{it-1}$  and  $\varepsilon_{it}$  are the error terms defined as the sum of a normal individual-specific effect ( $\mu_i, o_i, \eta_i$ ) plus a normal orthogonal white noise error ( $\delta_{it}, \pi_{it-1}, \xi_{it}$ ) where the latter follows a standard normal distribution.  $I(\cdot)$  are binary indicator functions equal to one if the underlying latent propensity exceeds some unobserved value (which can be set to zero without loss of generality) and equal to zero otherwise. Note that for those individuals who drop out of the panel ( $R_{it} = 1$ ), equation (4) if incidentally truncated, i.e. equation (6) describes a selection mechanism governing whether respondents enter the balanced 2-wave pooled panel and thus contribute to the estimation of poverty transitions.

For the model to be identified, exclusion restrictions are required. In other words, we will need to find a set of instrumental variables that affect the initial poverty status or panel retention (i.e. that enter equation (2) or (3)), but have no direct effect on poverty transitions (i.e. that are excludable from equation (1)). This is, we need to find variables entering  $\mathbf{z}_{it-1}$  or  $\mathbf{w}_{it-1}$  but not  $\mathbf{x}_{it-1}$  (see Section 3.2 for details). An alternative sufficient condition for identification would be to constrain the cross-equation correlations to zero from the outset. However, we follow Cappellari and Jenkins (2002, 2004, 2008) in estimating a general model with free correlation. This is we assume that the joint distribution of the unobservables ( $u_{it}, v_{it-1}$  and  $\varepsilon_{it}$ ) is trivariate standard normal with zero means and an unrestricted (and estimable) correlation structure. There are thus three correlations of interest to be estimated:

$$\begin{aligned} \rho_{12} &\equiv \text{corr}(u_{it}, v_{it-1}) = \text{cov}(\mu_i, o_i) && \text{the correlation between the unobservable factors} \\ &&& \text{affecting } P_{it} \text{ and } P_{it-1} \\ \rho_{23} &\equiv \text{corr}(v_{it-1}, \varepsilon_{it}) = \text{cov}(o_i, \eta_i) && \text{the correlation between the unobservable factors} \\ &&& \text{affecting } P_{it-1} \text{ and } R_{it} \\ \rho_{13} &\equiv \text{corr}(u_{it}, \varepsilon_{it}) = \text{cov}(\mu_i, \eta_i) && \text{the correlation between the unobservable factors} \\ &&& \text{affecting } P_{it} \text{ and } R_{it} \end{aligned} \quad (7)$$

The estimate of the correlation coefficient ( $\rho_{12}$ ) that summarises the association between the unobservable individual or household-specific factors determining current poverty (error term equation (1)) and base year poverty status (error term equation (2)) will provide a test for initial conditions exogeneity. Here, a positive (resp. negative) sign indicates that individuals or households who are more likely to be initially poor (due to unobservable factors, holding observable characteristics fixed), are more (resp. less) likely to be poor in the next period. Similarly, a positive

(resp. negative) estimated correlation coefficient ( $\rho_{23}$ ) between the error terms of equations (2) and (3) provides information on whether individuals or households who were more likely to be initially poor had a higher (resp. lower) likelihood of remaining in the sample. Finally, the estimated correlation coefficient ( $\rho_{13}$ ) between the error terms of equations (1) and (3) tests for exogeneity of sample retention to poverty transitions, such that a positive (resp. negative) sign indicates that individuals or households who were more likely to be observed in two successive waves were more (resp. less) likely to either remain poor or fall into poverty.

The likelihood-ratio test of no correlation between the cross-equation error terms may allow for a simplification of the suggested model. Other things being equal, if  $\rho_{12} = 0$ , then there is no initial conditions problem, i.e. the initial poverty status may be treated as exogenous. Likewise, if  $\rho_{23} = \rho_{13} = 0$ , then the process governing panel attrition can be ignored. In both cases, the model would then reduce to a bivariate probit regression. Lastly, if  $\rho_{12} = \rho_{23} = \rho_{13} = 0$  then poverty entry and exit equations may be estimated using simple univariate probit models (see Cappellari and Jenkins 2002, 2004, 2008).

The estimated parameter values allow predicting for each individual the *poverty persistence rate*,  $s_{it} \equiv \text{Pr}(P_{it} = 1 | P_{it-1} = 1)$ , and the *poverty entry rate*,  $e_{it} \equiv \text{Pr}(P_{it} = 1 | P_{it-1} = 0)$ , irrespective of the observed initial poverty status. The conditional probabilities are given by:

$$s_{it} \equiv \text{Pr}(P_{it} = 1 | P_{it-1} = 1) = \frac{\Phi_2(\gamma_1' \mathbf{x}_{it-1}; \beta' \mathbf{z}_{it-1}; \rho_{12})}{\Phi(\beta' \mathbf{z}_{it-1})} \quad (8)$$

and

$$e_{it} \equiv \text{Pr}(P_{it} = 1 | P_{it-1} = 0) = \frac{\Phi_2(\gamma_2' \mathbf{x}_{it-1}; -\beta' \mathbf{z}_{it-1}; -\rho_{12})}{\Phi(-\beta' \mathbf{z}_{it-1})} \quad (9)$$

where  $\Phi_2(\cdot)$  and  $\Phi(\cdot)$  denote respectively the cumulative density functions of the trivariate and the bivariate standard normal distribution (see Cappellari and Jenkins 2002, 2004, 2008).

### 3.2 Data, definitions and estimation

The econometric model specified above is fitted to panel data from the South African National Income Dynamics Study (NIDS) implemented by SALDRU at the University of Cape Town (SALDRU 2016a, b, c, d). NIDS is South Africa's first national panel study, which started with a nationally representative sample of over 28,000 individuals in 7,300 households. At present, there are four waves of data available, which are each spaced approximately two years apart, with the first survey being conducted in 2008. Data from pairs of consecutive waves  $t - 1$  and  $t$  were pooled, such that the determinants of poverty persistence and entry rates are derived by analysing transitions from 2008 to 2010/11, 2010/11 to 2012 and 2012 to 2014/15 controlling for period specific fixed effects.<sup>10</sup>

Households were classified as being poor versus non-poor using Statistics South Africa's (StatsSA) upper bound poverty line set at R963 (in January 2015 prices) per person per month, equivalent to about \$4 a day (in 2005 PPPs). The line is one of three national poverty lines published by StatsSA in 2015 using a cost-of-basic-needs (CoBN) approach to capture different degrees of poverty. Among these, the food poverty line (FPL) is the level of consumption below which individuals are unable to

<sup>10</sup> The post-stratified survey weights have been adjusted such that each period of wave-to-wave transitions accounts for the same share of observed transitions. This way, we aim to prevent our results to be over-proportionally influenced by transition periods for which more respondents could be tracked (note that attrition from the NIDS panel was highest in 2010). This adjustment is however found to have only a minor effect on the calculated average statistics (generally less than 0.5 percentage points difference).

purchase sufficient food to fulfil their caloric requirements, even if all expenditure is dedicated to food. The lower-bound poverty line (LBPL) allows for spending on non-food items, but requires that individuals sacrifice some food consumption in order to fulfil these non-food needs. Only at the upper-bound poverty line (UBPL), individuals can purchase both adequate food and non-food items. Given that we understand the satisfaction of basic needs a necessary condition for being considered middle class, we consider the UBPL the most adequate benchmark for our purposes.

Before proceeding to the model, we aim to illustrate the relevance of issues such as state dependence, initial conditions, and selective attrition that have been ignored in previous attempts to define the middle class based on a vulnerability criterion. For this purpose, panel (a) of Table 1 shows the raw poverty transition matrix constructed using the restricted sample of individuals for whom two consecutive NIDS waves with non-missing expenditure data are available (74,217 observations). As can be seen, the chances of being poor in a given year (not controlling for anything) differ substantially depending on the previous period's poverty status. Less than two in ten individuals who were poor in one wave were no longer poor in the next wave. By contrast, about seven in ten who were initially non-poor remained out of poverty. On average, the poverty rate among the former is more than 50 percentage points higher than the poverty rate among the latter. Note that this measure does not yet control for unobserved heterogeneity between individuals, an issue that the applied modelling framework will specifically account for (Jenkins, 2011).

Panel (b) of Table 1 draws attention to the issue of non-random attrition because of sample drop-out or item non-response. The potential arises not so much from the fact that about 18 per cent of the full pooled sample (90,674 observations) are not being retained from one wave to the other, but more from the observation that retention rates differ by poverty status in  $t - 1$ , with the initially non-poor showing a higher propensity of attrition. This raises questions of representativeness of the sample of 'stayers'. Our multivariate probit model allows for non-random retention and for its joint determination along with the initial conditions and poverty transition processes (Jenkins, 2011).

**Table 1: Poverty inflow and outflow rates (row %) between survey waves**

Poverty status, year $t - 1$	Poverty status, year $t$		
	Non-poor	Poor	Missing
<b>(a) Sample with non-missing expenditure at <math>t</math></b>			
Non-poor	73.62	26.38	
Poor	17.33	82.67	
<i>All</i>	36.49	63.51	
<b>(b) All individuals</b>			
Non-poor	55.25	19.80	24.95
Poor	14.85	70.81	14.34
<i>All</i>	29.82	51.90	18.28

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights).

Notes: Respondents are classified as poor if their household's per capita expenditure falls below the StatsSA UBPL of R963 (in January 2015 prices). Missing expenditure data at  $t$  arise either from sample attrition or incomplete response within a respondent's household (see text for further details). The post-stratified survey weights used here have not been corrected for panel attrition.

In proceeding to the endogenous switching regression, the choice of regressors follows the previous literature. Because the individual poverty status is identified using per capita household expenditure, all explanatory variables in our poverty transition equation (1) were also measured at the household level. They mostly summarize the demographic composition and labour market attachment of the household in which the individual lives. In this regard, the covariates either refer to the household

head including demographics (age, age squared, gender, and race), years of education, and labour market status or occupation, or the household itself, including a set of variables capturing the composition and age structure of the household, the number of employed members and controls for geographic location. All variables were measured in the base year (wave  $t - 1$ ) prior to a potential poverty transition (experienced in wave  $t$ ) and, in line with most of the poverty modelling literature, are thus assumed to be pre-determined. For this very reason, variables summarising the occurrence of economic shocks or other types of ‘trigger events’ are not used in this specification.

As explained in the previous section, statistical identification of the model parameters requires exclusion restrictions. Specifically, we need to find a set of instrumental variables that affect initial poverty status or sample retention, but have no direct effect on poverty transitions. For the base-year poverty status, we follow the previous literature in using a set of instruments summarising both the mother’s and father’s highest level of education attained (also including variables to indicate missing information on the items of interest). We add controls for the kind of work usually done by the parent in the current or last job in order to separate these labour market effects likely adding to the current income situation from the factors determining the respondent’s parental background. Thus, the explanatory variables for initial conditions include all the variables to explain poverty transitions plus the parental background indicators, which are assumed to have a direct impact on the initial poverty status in the base-period, but not on poverty entry or exit in subsequent waves.

Following Cappellari and Jenkins (2002, 2004, and 2008) and Jenkins (2011), the set of instruments for sample retention includes a binary variable indicating whether the respondent is an original sample member (OSM) who has been in the NIDS panel since the first wave, or joined the survey later as temporary sample member (TSM) by moving in with or being born into an OSM household.<sup>11</sup> Thus, the explanatory variables for the panel retention equation include all the variables to explain poverty transitions plus the sample membership control, which is assumed to affect panel retention or attrition, but be orthogonal to the poverty transition propensity. Our test results reported in panel (c) of Table 2 support the validity of the proposed instruments. The parental background indicators and the sample membership variables can be excluded from the poverty transition equation, and are statistically significant in the respective selection equations.

In order to assess the exogeneity of the two selection mechanism to the process of poverty transitions, in addition, we tested the separate and joint significance of the correlation coefficients. In Table 3, panel (a) reports the estimates of the cross-equation correlations between unobserved characteristics per se. In line with previous findings in the literature, we observe the correlation between unobservables affecting initial poverty status and conditional current poverty ( $\rho_{12}$ ) to be negative and statistically significant, which can be interpreted as an example of Galtonian regression towards the mean (Stewart and Swaffield, 1999). The correlation coefficients between the unobservables affecting initial poverty and sample retention ( $\rho_{23}$ ), as well as conditional current poverty and sample retention ( $\rho_{13}$ ) are not significantly different from zero. The related exogeneity tests are reported in panel (b) of Table 2. Exogeneity of initial condition would imply that that  $\rho_{12}$  and  $\rho_{23}$  are jointly zero – a hypothesis that is strongly rejected (Wald test  $p < 0.000$ ). Exogeneity of sample retention in return would imply that  $\rho_{13}$  and  $\rho_{23}$  are jointly zero. Here, we cannot reject the null hypothesis (Wald test  $p < 0.947$ ). The results indicate that retention can be considered exogenous to the model. For this reason, in the following, we reduce the analysis to a bivariate probit model of poverty transitions that controls for endogenous initial conditions, which can be considered sufficient for the problem at hand. However, we will use the coefficient estimates from the panel retention equation to adjust the survey weights in the pooled panel to account for unfolding

---

<sup>11</sup> We tried adding a dummy variable to the set of instruments for whether the respondent was classified by the interviewer as friendly and very attentive, or not. However, this variable did not fulfil the exclusion restriction.

attrition. This is, respondents that were tracked over two consecutive waves will received a new weight calculated as the product of the original post-stratified weight of the initial period and the inverse of the conditional probability of re-interview.

**Table 2: Estimates of model correlations, and model test statistics**

(a) Correlation coefficients between unobservables	Estimate	s.d.
Base year poverty status and conditional current poverty status ( $\rho_{12}$ )	-0.272	0.055
Base year poverty status and retention ( $\rho_{23}$ )	0.008	0.024
Retention and conditional current poverty status ( $\rho_{13}$ )	0.001	0.026
Null hypotheses for tests	Test statistic	p-value
<b>(b) Wald test for exogeneity of selection equations</b>		
Exogeneity of initial conditions, $\rho_{12} = \rho_{23} = 0$	24.23	0.0000
Exogeneity of sample retention, $\rho_{13} = \rho_{23} = 0$	0.11	0.9465
Joint exogeneity, $\rho_{12} = \rho_{23} = \rho_{13} = 0$	24.30	0.0000
<b>(c) Instrument validity</b>		
Exclusion of parental background from transition equation (d.f. = 20)	27.50	0.1217
Exclusion of sample membership status from transition equation (d.f. = 2)	1.73	0.4214
Exclusion of parental background and sample membership status from transition equation (d.f. = 22)	30.14	0.1150
Inclusion of parental background in initial conditions equation (d.f. = 10)	243.68	0.0000
Inclusion of sample membership status in retention equation (d.f. = 2)	604.15	0.0000
<b>(d) Test of state dependence</b>		
No state dependence, $\gamma'_1 = \gamma'_2$	269.56	0.0000

Source: Authors' calculations based on pooled transitions from NIDS waves 1 to 4.

Note: See text for discussion of model estimation method and tests.

The impacts of the explanatory variables on poverty transition (equation (1)) from the bivariate probit model are summarised in Table 3. (The estimates from the multivariate probit model are provided in Tables A.1 to A.3 in the Appendix). Given that we could not reject the hypothesis that there is state-dependence (see Table 2), we report two sets of estimates, depending on the initial poverty status in  $t - 1$ . The first column of each set shows the coefficient estimate of a change in each explanatory variable in  $\mathbf{x}_{it-1}$  on the probability of poverty persistence ( $s_{it}$ ) and poverty entry ( $e_{it}$ ) respectively. By construction, the probability of the conditioning event, which is being poor in the former case and non-poor in the latter, is held constant in these estimations.

We observe that race remains a strong predictor of poverty in South Africa, with Africans being at the highest risk of being in poverty whereas whites are significantly less likely to be poor, even after controlling for differences in education and employment. Members of female headed and rural agricultural households also face a higher risk to poverty, just as those living in household with presence of dependent children or where the head is unemployed. By contrast, a higher level of education of the household head and having a working head, ideally in a management position or other white-collar occupation, are strong predictors for a lower vulnerability to poverty. Having an older head generally tends to go in line with a more stable socio-economic position, in the sense that the chances for poverty entry and exit are lower (poverty persistence is higher). Similarly, mobility seems to be comparatively high in the Western Cape, compared to other provinces marked by generally lower poverty entry and exit rates. Poverty persistence seems to be highest in KwaZulu-Natal, followed by the Eastern Cape, Mpumalanga, and Free State. Generally, risks of remaining in or falling into poverty were higher between waves 1 to 2 (2008 to 2010/11) than between waves 2 to 3 (2010/11 to 2012) or waves 3 to 4 (2012 to 2014/15).

**Table 3: Bivariate probit model: Poverty transitions**

<i>Covariate</i>	Stats SA upper bound poverty line			
	Poverty persistence		Poverty entry	
	marginal eff.	t-statistic	marginal eff.	t-statistic
<i>Characteristics of the head of household (HoH)</i>				
HoH age	0.004	(2.69)***	-0.008	(-2.93)***
HoH age squared (x0.01)	-0.006	(-3.80)***	0.002	(0.57)
HoH is female	0.021	(2.37)**	0.106	(7.13)***
HoH years of education	-0.013	(-9.69)***	-0.033	(-11.36)***
HoH race group (base: African)				
Coloured	-0.014	(-0.77)	-0.165	(-6.80)***
Asian/Indian	-0.570	(-13.98)***	-0.416	(-10.09)***
White	-0.499	(-5.06)***	-0.408	(-8.69)***
HoH employment (base: inactive)				
Unemployed (discouraged)	0.027	(1.29)	0.023	(0.59)
Unemployed (strict)	0.005	(0.33)	0.043	(1.53)
Managers, professionals and technicians	-0.092	(-3.04)***	-0.082	(-2.84)***
Clerical, service and sales occupations	-0.044	(-2.09)**	-0.020	(-0.71)
Craft and trade workers, supervisors	0.056	(2.21)**	-0.032	(-0.82)
Plant and machine operators	-0.035	(-1.39)	0.011	(0.32)
Elementary occupations	-0.002	(-0.14)	0.056	(2.13)**
Other	0.021	(1.54)	0.080	(3.18)***
<i>Characteristics of the household (HH)</i>				
No. of workers in HH	-0.027	(-6.00)***	-0.036	(-4.40)***
Age composition				
No. of children aged 0-2 in HH	0.050	(11.82)***	0.094	(6.36)***
No. of children aged 3-4 in HH	0.063	(8.81)***	0.085	(4.29)***
No. of children aged 5-11 in HH	0.045	(5.04)***	0.059	(3.44)***
No. of children aged 12-15 in HH	0.049	(7.58)***	0.046	(6.20)***
No. of children aged 16-18 in HH	0.031	(8.64)***	0.044	(4.66)***
No. of elderly aged 60-75 in HH	-0.005	(-0.60)	0.072	(5.18)***
No. of elderly aged 75 plus in HH	0.060	(3.86)***	0.096	(3.07)***
Geographic location (base: traditional)				
Urban	-0.005	(-3.56)***	-0.093	(-5.18)***
Farms	0.060	(2.28)**	0.040	(1.40)
Province fixed effects (base: Western Cape)				
Eastern Cape	0.074	(4.11)***	-0.112	(-4.06)***
Northern Cape	0.016	(1.00)	-0.075	(-2.87)***
Free State	0.048	(2.38)**	-0.204	(-6.77)***
KwaZulu-Natal	0.112	(6.30)***	-0.005	(-0.20)
North West	0.036	(1.74)*	-0.112	(-3.15)***
Gauteng	0.033	(1.69)*	-0.124	(-4.78)***
Mpumalanga	0.064	(3.20)***	-0.102	(-3.58)***
Limpopo	0.032	(1.57)	-0.099	(-3.12)***
<i>Time fixed effects</i>				
Wave 3	-0.034	(-3.08)***	-0.085	(-4.76)***
Wave 4	-0.143	(-13.07)***	-0.161	(-9.53)***
Constant	0.333	(7.04)***	0.457	(7.06)***
Log-likelihood	-92,950,000			
Model chi2 (d.f. = 125)	21,845			
Number of observations	67,624			

Robust standard errors clustered at the individual level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

While the effects for most of the explanatory variables point into the same direction for both sets of estimates, the size of the effect on the poverty propensities differs importantly, depending on whether the individual was already poor in the initial period (a test of whether the two sets of coefficients are identical can be rejected at all common significance levels, compare Table 2). The results reported in Table 3 suggest that one of the channels through which a past poverty experience seems to increase the risk to future poverty is the depreciation of human capital, as well as potential signalling effects – in the sense that employers may consider past experiences of (long-term) unemployment as negative signals in a recruitment process with respect to the applicant’s capacity or productivity – and the potential acceptance of low quality job offers that may be associated with future unemployment spells. Yet, everything else equal, initially poor (non-poor) had a lower (higher) poverty propensity, indicating some regression towards the mean. Put simply, following an extreme random event, the next random event may likely be expected to be less extreme.

**3.3 Predicted poverty transition probabilities and social stratification in South Africa**

We use the endogenous switching model to predict poverty exit and entry probabilities of initially poor versus non-poor individuals. These are evaluated against two probability thresholds, displayed in Table 4 panel (a), based on the actually observed rates of poverty exit and entry in our data. We observe that, on average, 17.37 per cent of the initially poor escaped poverty from one wave to the next in the pooled sample. This will be the cut-off point separating the chronically poor from the transient poor. Analogously, we observe that the average probability of falling into poverty for those who were initially non-poor was 26.29 per cent in our pooled sample. This probability cut-off will be used to separate the vulnerable from the middle class.

For comparative purposes, we also give an indication of the monetary thresholds associated with these probability cut-off points. We calculate the average monthly per capita household expenditure of those respondents with a predicted poverty transition probability that falls within the 95-per cent confidence interval of the respective probability threshold. We find that the average probability of exiting poverty is associated with a monetary threshold of R569 per person per month, which falls between StatsSA’s food poverty line (R430) and the lower bound poverty line (R629) (in January 2015 prices). The average probability of entering poverty is associated with a monetary threshold of R2,885 per person per month. Thus, on average, respondents living in households with expenditure levels above this threshold could be considered reasonably secure against falling into poverty.

**Table 4: Predicted probability thresholds and associated monetary thresholds**

	(a) Probability threshold (%)				(b) Associated monetary threshold			
	Mean	Std. Err.	[95% Conf. Int.]		Mean	Std. Err.	[95% Conf. Int.]	
Average probability of <b>EXITING</b> poverty for those who were poor in the last period	17.37	0.17	17.04	17.69	569	5	559	580
Average probability of <b>FALLING</b> into poverty for those who were non-poor in the last period	26.29	0.35	25.61	26.98	2885	91	2705	3064

Source: Author’s calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition). Note: Poverty transition probabilities are predicted using parameter estimates from our regression model. The associated monetary thresholds are calculated as the average per capita household expenditure of those falling into the 95% confidence interval around the respective probability threshold. All monetary values are expressed in January 2015 Rands.

These monetary thresholds however mask a substantial degree of variation in the predicted poverty transition probabilities among individuals living in households with similar current expenditure levels, as Table 5 illustrates. Although the transient poor tend on average to be better off than the chronically poor, members of both groups can be found anywhere below the poverty line, spanning the full range. Similarly, while the middle class is on average better off than the vulnerable, members of both groups can be located anywhere between the poverty line and the elite cut-off fixed at R10,484 per person per month.

**Table 5: Monthly household expenditure per person by social class**

	Min	Max	Median	Mean	[95% Conf. Interval]	
<b>Chronic Poor</b>	29	963	343	388	1	386
<b>Transient Poor</b>	24	963	612	600	2	596
<b>Vulnerable</b>	963	10,418	1,578	2,043	11	2,022
<b>Middle class</b>	963	10,470	3,173	3,899	21	3,858
<b>Elite</b>	10,488	131,514	15,347	19,218	284	18,661

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

Note: All monetary values are expressed in January 2015 Rands.

## 4. Class formations, social inequality and mobility in South Africa

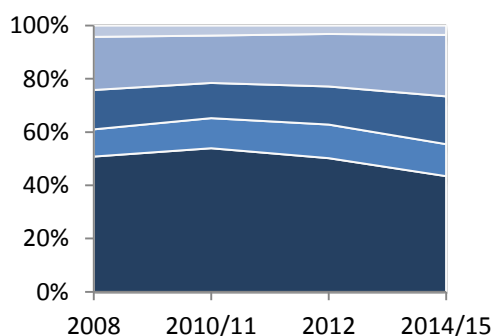
In this section, we provide a profile of the five identified social strata in South Africa – the chronically poor, the transient poor, the vulnerable, the middle class, and the elite – in terms of their relative size, growth performance, racial composition, and labour market resources.

### 4.1 Class characteristics and inequality patterns

According to the suggested stratification schema, South Africa's middle class accounts for around 20 per cent of the total population and has grown sluggishly between 2008 and 2014/15 (see Figure 2 and Table 6). The modest decline in poverty over the years under study has resulted in an increase in the size of the group of the vulnerable, whose population share expanded from around 15 per cent to about 19 per cent. The elite makes up around 3 to 4 per cent of the population, where the slight contraction in size went in line with a yet higher concentration of wealth in the hands of a few at the top (see Zizzamia et al., 2016).

**Table 6 and Figure 2: South Africa's social structure, 2008 to 2014/15**

	2008	2010/11	2012	2014/15	Total
■ Elite	4.28	3.73	3.19	3.60	3.66
■ Middle class	19.90	17.88	19.65	23.00	20.20
■ Vulnerable	14.74	13.16	14.31	17.94	15.13
■ Transient Poor	10.32	11.24	12.69	12.02	11.66
■ Chronic Poor	50.76	53.98	50.16	43.45	49.35
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>



Source: Authors' calculations using NIDS waves 1 to 4 (with post-stratified weights).



Table 7 provides an overview of the key average characteristics associated with the five classes in our schema, which by construction closely mirror the determinants of poverty transitions reported in Table 3 above. Strikingly, the transient poor are generally closer to either the vulnerable –e.g., in terms of the average education and occupation of the household head – or even the middle class – e.g., with respect to the household composition and location – than to the chronic poor.

**Table 7: Average class characteristics, 2008 to 2014/15**

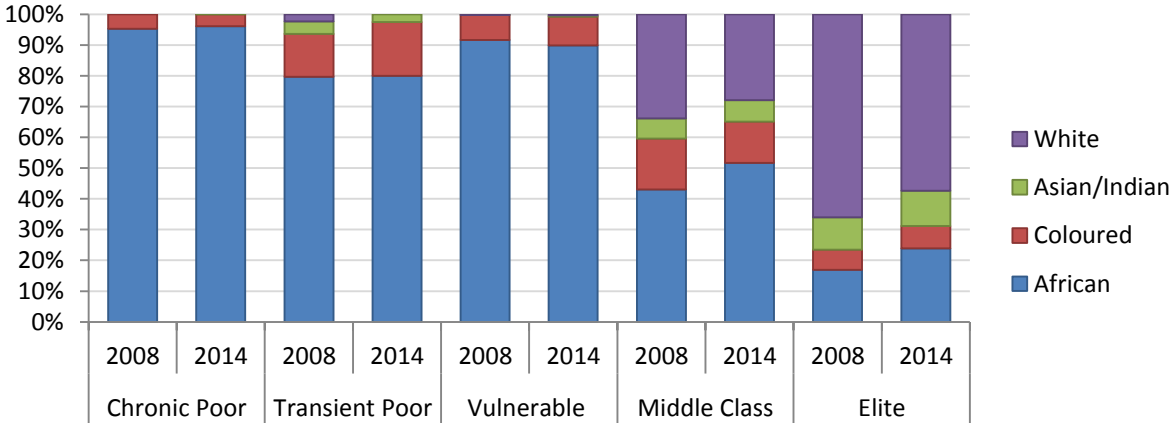
	Chronic Poor	Transient Poor	Vulnerable	Middle Class	Elite	Total
<i>Characteristics of the head of household (HoH)</i>						
HoH age	50	45	43	46	48	47
HoH is female	70%	50%	59%	31%	28%	57%
HoH years of education	6	9	9	12	14	8
HoH race group						
African	95%	79%	90%	46%	18%	80%
Coloured	5%	16%	9%	14%	7%	9%
Asian/Indian	0%	2%	1%	8%	10%	2%
White	0%	2%	0%	32%	65%	9%
HoH employment						
Inactive	54%	35%	31%	19%	20%	40%
Unemployed (discouraged)	4%	1%	2%	2%	0%	3%
Unemployed (strict)	13%	10%	12%	4%	1%	10%
Managers, professionals and technicians	1%	6%	4%	29%	44%	9%
Clerical, service and sales occupations	2%	11%	8%	16%	7%	7%
Craft and trade workers, supervisors	2%	2%	3%	8%	5%	4%
Plant and machine operators	2%	7%	6%	6%	2%	4%
Elementary occupations	9%	13%	15%	4%	1%	9%
Other	14%	15%	19%	12%	20%	14%
<i>Characteristics of the household (HH)</i>						
No. of workers in HH	0.89	1.34	1.11	1.45	1.25	1.10
Age composition						
No. of children aged 0-2 in HH	0.61	0.22	0.27	0.13	0.09	0.40
No. of children aged 3-4 in HH	0.45	0.13	0.19	0.12	0.04	0.29
No. of children aged 5-11 in HH	1.36	0.47	0.60	0.39	0.17	0.90
No. of children aged 12-15 in HH	0.72	0.23	0.32	0.25	0.13	0.49
No. of children aged 16-18 in HH	0.55	0.22	0.25	0.19	0.12	0.38
No. of elderly aged 60-75 in HH	0.33	0.27	0.22	0.22	0.26	0.28
No. of elderly aged 75 plus in HH	0.10	0.04	0.04	0.05	0.06	0.07
Geographic location						
Traditional	56%	14%	27%	4%	3%	34%
Urban	39%	82%	67%	92%	95%	61%
Farms	5%	4%	5%	4%	2%	5%
Province:						
Western Cape	5%	22%	13%	17%	15%	11%
Eastern Cape	18%	7%	9%	7%	6%	13%
Northern Cape	2%	5%	3%	3%	2%	2%
Free State	5%	7%	5%	6%	4%	5%
KwaZulu-Natal	29%	6%	15%	10%	18%	20%
North West	5%	6%	5%	6%	3%	5%
Gauteng	13%	35%	30%	40%	39%	25%
Mpumalanga	11%	5%	9%	5%	9%	9%
Limpopo	13%	7%	9%	4%	3%	10%
Per capita expenditure (mean)	388	600	2,043	3,899	19,218	2,062
Per capita expenditure (median)	343	612	1,578	3,173	15,347	663

Source: Authors' calculations using NIDS waves 1 to 4 pooled sample (with post-stratified weights).

In line with our finding that having an older household head tends to be associated with both higher poverty persistence and a lower likelihood to enter poverty, heads are on average oldest among the chronically poor and the elite. Given that higher levels of education tend to be accompanied by a lower risk to poverty, heads of chronically poor households are on average the least educated with no more than five years of primary education, while the transient poor and the vulnerable tend to have some secondary education. A household head in the middle class generally has completed secondary schooling, while those in the elite tend to have some tertiary education. Female household headship is in return is strongly correlated with belonging to disadvantaged social classes. We observe that about seven in ten chronically poor households are female headed, whereas the same is true for no more than three in ten households among the middle class or elite. It is also worth noting that more disadvantaged social classes tend to have more children and elderly household members than the middle or elite classes. This finding resonates with previous research findings that exposed demographic factors, in particular an elevated presence of dependants in a household, as important predictors of risks of poverty entrance and poverty persistence (Finn and Leibbrandt, 2016; Woolard and Klasen, 2005).

Given that race tends to be a strong predictor of poverty in South Africa, it is unsurprising that the chronically poor group is almost exclusively made up by Africans and Coloureds. These two groups also constitute the vast majority of the transient poor and the vulnerable. However, coloureds seem to be more heavily concentrated amongst the transient poor (note that this lower chance to be persistently poor was not statistically significant in the regression results) and the stable middle class, facing lower risks of downward mobility. Although Africans also constitute the largest proportion of the middle class – with a growing trend in recent years illustrated in Figure 3 – their share among the two top groups remains far from demographic representivity. That is, while Africans make up about 80 per cent of the total population, in 2014/15 they made up just above 50 per cent of the middle class. On the other hand, while whites constitute a mere 10 per cent of the South African population, almost one in three members of the middle class and two in three members of the elite are white.

**Figure 3: Racial composition of South Africa’s five social classes, 2008 and 2014/15**

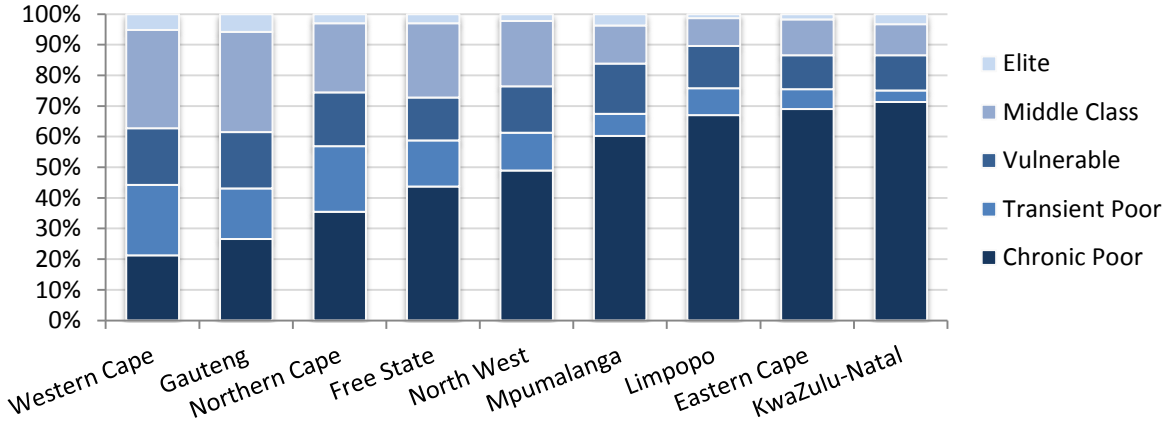


Source: Authors’ calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights).

The geographic split of the classes is also striking, with the chronically poor most likely to be situated in traditional rural areas. Also among the vulnerable – as compared to the other groups that almost exclusively reside in urban areas– we observe a comparatively high proportion being located in the rural parts of the country (recall Table 7). Among South Africa’s nine provinces, KwaZulu-Natal has the highest rate of chronic poverty and the second smallest middle class (after Limpopo). However, KwaZulu-Natal also has the fourth largest elite (after Gauteng, the Western Cape, and Mpumalanga),

indicating a substantial degree of local social inequality. Chronic poverty is lowest in the Western Cape and in Gauteng – which are also the two provinces with the strongest middle class and elite. While vulnerability is substantial in all provinces, including those provinces with low levels of chronic poverty, such as the Western Cape and Gauteng, we observe a negative relationship between the extent of chronic and transient poverty across the provinces (see Figure 4).

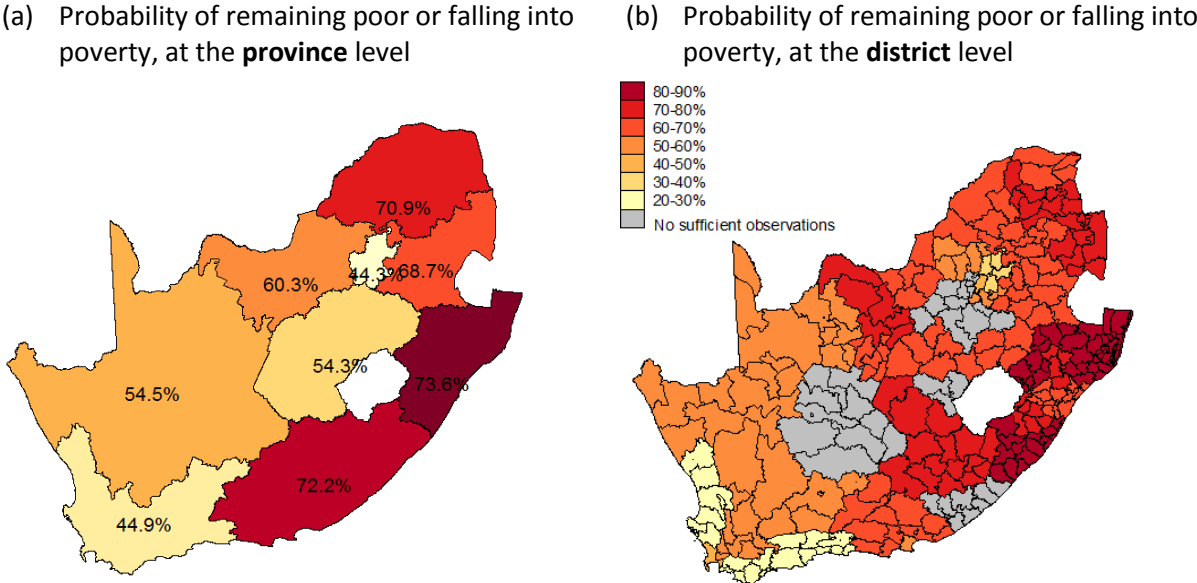
**Figure 4: Geographic split of South Africa’s five social classes, 2008 to 2014/15**



Source: Authors’ calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights).

The maps in Figure 5 illustrate this geographic pattern clearly. The two maps report, for each province and district council respectively, the average propensity to poverty for the population of that province / district. The provinces with the highest average propensity to poverty (panel (a)) are KwaZulu Natal, Eastern Cape, and Limpopo respectively. Unsurprisingly, these are the provinces with in which most of the former Bantustans were located. This is yet more clearly evident in panel (b), where the darkest areas of the map correspond closely to the geographic location of former homelands. It is apparent that the apartheid legacy is still most strongly felt in these severely underdeveloped rural areas, which remain poorly integrated into the South African economy.

**Figure 5: Pockets of high propensity to poverty in South Africa, 2014/15**

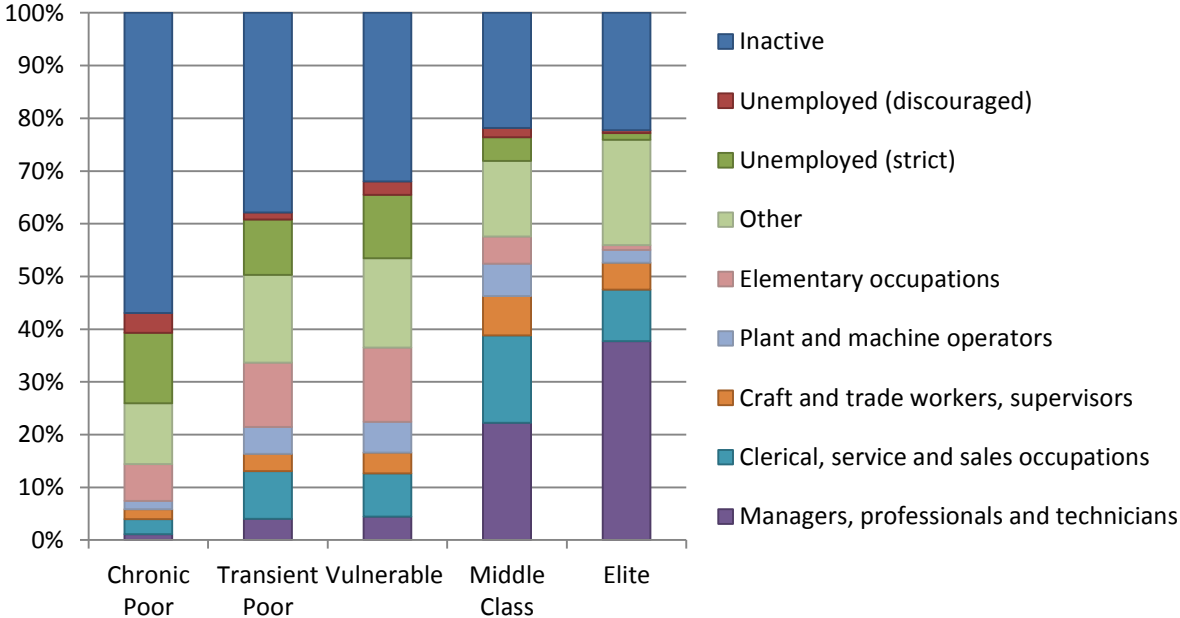


Source: Authors’ calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights).

Note: In Panel (b), only districts with at least 400 respondents in NIDS wave 4 were kept.

There is also a clear differentiation between classes in terms of access to the labour market: The more disadvantaged the class that a household belongs to, the more likely it is that the household head is unemployed or economically inactive. Over 70 per cent of household heads amongst the chronically poor are not employed, either being economically inactive or unemployed. Amongst the transient poor and the vulnerable, around 50 per cent are not employed. This figure drops substantially when the middle class and elite are considered, for whom the unemployment rate is very low (between 1 and 5 per cent). Amongst those who are employed in the respective classes, household heads of chronically poor households are most likely to be employed in elementary occupations. Similarly, for household heads belonging to transient poor and the vulnerable households, elementary occupations also dominate, followed in significance by service and sales occupations. Among the middle and elite classes, a very high proportion of household heads are employed in high skilled occupations, such as managers, professionals, or technicians (see Figure 6).

**Figure 6: South Africa’s five social classes in the labour market, 2008 to 2014/15**



Source: Authors’ calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights).  
 Note: Figures represent employment status and occupational category limited to heads of households.

**4.2 A dynamic perspective on the determinants of social class and inter-class transitions**

The net changes in South Africa’s class structure reported above may mask a substantial degree of inter-class mobility. Tables 9 and 10 illustrate these mobility patterns.

In line with our classification schema, 80.7 per cent of those who were considered chronically poor remained poor from one survey wave to the other, 7.1 per cent improved their chances of exiting poverty and were considered transient poor, and only about one in ten individuals actually exited poverty. By contrast, approximately every fourth among the transient poor jumped the poverty line from one survey wave to the next. Almost every second respondent in the vulnerable group slipped into poverty over time, though generally maintaining relatively high chances of poverty exit. The middle class were largely stable, with about 72 per cent of all members maintaining their status over time. Of the less than 10 per cent who slipped below the poverty line, only a small fraction fell into a trap of chronic poverty. The elite was also largely stable at the top. In ten members of the elite, on average five were able to maintain their positions, about four entered the middle class, and only one

was actually at risk of falling into poverty. Table 9 also illustrates the importance of the overall macroeconomic framework in determining poverty risks. On average, more (less) respondents exited (fell into) poverty between 2012 and 2014/15 than in the years before between 2008 and 2012, which may partly be attributed to the global economic crisis that hit South Africa in 2009/10.

**Table 8: Movements across classes, 2008 to 2014/15**

Pooled Sample (two consecutive waves)		wave <i>t</i>					Total
		Chronic	Transient	Vulnerable	Middle Class	Elite	
wave <i>t</i> - 1	Chronic poor	80.71	7.08	10.39	1.72	0.1	100
	Transitory poor	20.2	38.71	22.85	17.73	0.51	100
	Vulnerable	30.74	18.02	33.82	16.18	1.25	100
	Middle class	2.26	7.63	10.93	71.95	7.24	100
	Elite	0.9	1.81	3.76	45.74	47.79	100
	<b>Total</b>	51.1	12.29	15.09	18.76	2.77	100

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

**Table 9: Poverty entry and exit, 2008 to 2014/15**

Share (%) by class that...		Pooled	2008-2010	2010-2012	2012-2014
1) ...exited poverty:	Chronic Poor	12.21	8.57	10.20	17.80
	Transient	41.09	35.16	40.17	45.86
2) ...fell into poverty:	Vulnerable	48.76	59.22	51.65	37.15
	Middle class	9.89	10.90	9.28	9.64
	Elite	2.71	4.97	1.94	1.87

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

An intuitive way of exploring the determinants of class membership and inter-class transitions is to examine the predicted probabilities of poverty entry and exit and associated expenditure levels for persons with different combinations of characteristics. The various predictions are summarized in Table 10, and were derived using the point estimates of the poverty transition equation reported in Table 3 above. By construction, the estimates control for the selection biases associated with initial poverty status and retention.

Our reference person, case (1), can be seen to represent a 'typical' member of the middle class in South Africa. In line with the average class characteristics reported in Table 7 above, this reference person lives in a household with a head who is a male, African, 45 years old, has completed matric (12 years of schooling), and works in a high-skill job (i.e., is a manager, professional, or technician), with one child aged 5-11 and no adults aged 60+ present in the household, and is living in an urban area in Gauteng. Using the results from our multivariate probit model we predict that this reference person, if initially non-poor, faces a probability of falling into poverty over time of 10.6 per cent, and, in case of being initially poor, would have a probability of exiting poverty of 32.6 per cent.

For illustrative purposes, we predict the average per capita expenditure conditional on household characteristics for this middle-class reference person using a log-linear autoregressive model (AR(1)) for consumption. The current (logarithmised) expenditure level is explained by its first lagged value observed in the previous wave – which is assumed to be endogenous and thus instrumented using the same parental background variables presented before in the initial poverty status equation – and a set of exogenous covariates observed in the present wave, identical to the explanatory variables

used in the poverty transition equation (see Table A.3 Appendix for estimation results). With the additional assumption that all relevant processes are in a stationary equilibrium, the predicted steady-state expenditure level for our middle-class reference person is R2,550 per month, which is more than twice the basic-needs requirement captured by the poverty line (R963).

In the following, we first investigate how the predicted poverty entry and exit probabilities and expenditure level change, as we stepwise modify the reference person's household characteristics to represent a 'typical' member of the vulnerable class in South Africa, case (4). In doing so we are able to illustrate the role that time-invariant characteristics (such as race) have on determining poverty risks and class position, as well as the potential effects that time-variant household characteristics (such as having a child) can play in determining poverty transition probabilities and class situations.

As discussed in section 4.1, compared to the middle class, someone in the vulnerable group is most likely to live in a household with a head who is also African, but who is somewhat younger, female, and has only about nine years of education (compare Table 7). Adjusting the age and the gender of the household head leads to a moderate decline in the predicted expenditure level (from R2,550 to R2,341), accompanied by a rise in the predicted likelihood of falling into poverty from 10.56 to 18.1 per cent. Reducing the level of education attained by the head to nine years of schooling leads to a further contraction of the predicted expenditure level to R1,994 and increase in the propensity to enter poverty above 26.1 per cent threshold, which pushes the person from being middle class to the edge of entering the group of the vulnerable (note that the probability cut-off value is fixed at an poverty entry rate of 26.3 per cent). If we further, in line with our earlier descriptive analysis, change the occupational status of the head to being not economically active (though still assuming that there is one employed household member), the predicted expenditure level that our reference person may afford is halved to R833, which falls just below the basic-needs poverty line (R963). The probability of slipping into poverty accordingly surges to 33.6 per cent and, once in poverty, the chances of making it out again are just below 20 per cent.

This exercise illustrates nicely how closely the states of vulnerability and transient poverty lie together. Given their characteristics, those in the vulnerable group would be expected to be poor, which raises doubts about their ability to sustain a living standard above subsistence in the longer run. The latter is especially true when we assess the ability of our stylised person (4) to cope with some 'economic shock' or other event affecting the household's financial situation, and compare this to the ability of our middle class reference person (1) to buffer such events.

First, we investigate the effect that having a child (aged 0-2) would have on different classes. For the middle class household this shock reduces the predicted financial means available per person by about R378, while for the transient poor household per capita income is reduced by R187, pushing the latter alarmingly close to the food poverty line. For the middle class person, the risk of falling into poverty rises from 10.6 to 16.0 per cent, whereas for the transient poor person the chance of exiting poverty decreases from 19.5 to 15.9 per cent.

Second, we investigate the effect that a loss of employment of the household head has on different classes. For the reference middle class person (1), this shock would result in a surge in the predicted poverty propensity just above 10 to more than 20 per cent, accompanied by a fall in expected expenditure from R2,550 to R1,386. Note that this is the short-run effect setting the past periods expenditure level at R2,550. If the head remains (strictly) unemployed, the long-run or steady-state expenditure level would be even lower, at R996 – which is remarkably close to the poverty line. This illustrates nicely the fact that the middle class – despite being comparably economically secure – is certainly not invulnerable to any type of shock. As its members generally derive their status from income generated on labour market, they depend on this source of income to sustain their lifestyle.

In line with the preceding simulations, we also investigate the effects of modifying the middle-class reference person's characteristics to represent a 'typical' member of the elite in South Africa. Here we observe that, while higher levels of education and smaller household sizes play a role, race remains key in explaining elite status. Merely being white dramatically increases predicted per capita household expenditure, and decreases the probability of falling into poverty. Like middle class households, for an elite household, a job loss of the household head tends to go in line with a notable scaling down of living standards. However, this generally implies a descent into the middle class, leaving the household with a risk of falling into poverty of less than one per cent.

**Table 10: Predicted poverty probabilities for persons with different combinations of characteristics**

	Predicted p.c. HH exp.	Predicted prob. of FALLING into poverty	Predicted prob. of EXITING poverty	Class
(1) A typical member of the middle class may live in a household with a head who is a male, African, 45 years old, has achieved matric (12 years of schooling), works in a white collar job, e.g. as manager, professional, or technician, has one child of age 5-11 and no adults aged 60+ present in the household, and lives in urban area in Gauteng.	2,550	10.56%	(32.56%)	Middle Class
→ Reaction of (1) to birth of a child	2,172	16.00%	(27.78%)	Middle Class
→ Reaction of (1) to job loss (of household head who becomes strictly unemployed)	1,386	20.74%	(21.85%)	Middle Class
<b>Gradually adjust the characteristics in (1) to represent a typical member of the vulnerable group</b>				
(2) As (1), except household head is female and 43 years old	2,341	18.11%	(30.34%)	Middle Class
(3) As (2), except household head has 9 years of schooling	1,994	26.07%	(26.71%)	Middle Class/ Vulnerable
(4) As (3), except household head is not economically active (but one other household member is employed)	833	(33.56%)	19.46%	Transient Poor
→ Reaction of (4) to birth of a child	646	(43.30%)	15.91%	Chronic Poor
→ Reaction of (4) to job loss (of the only employed household member)	785	(37.18%)	17.52%	Transient/ Chronic Poor
<b>Gradually adjust the characteristics in (1) to represent a typical member of the elite</b>				
(5) As (1), except household head is 48 years old	2,569	9.60%	(32.99%)	Middle Class
(6) As (5), except household head has 14 years of schooling	2,858	6.88%	(35.61%)	Middle Class
(7) As (6), except no children living in the household	3,378	5.00%	(40.30%)	Middle Class
(8) As (7), except household head is white	11,378	0.33%	(87.71%)	Elite
→ Reaction of (8) to birth of a child	8,828	0.69%	(84.69%)	Middle Class
→ Reaction of (8) to job loss (of household head who becomes strictly unemployed)	4,185	1.12%	(79.82%)	Middle Class

Source: Own simulations based on coefficient estimates reported in Table 3.

Note: To be considered middle class, individuals must have a maximum predicted risk to falling into poverty of 26.29%. Transient poor have a chance of exiting poverty of 17.37% or above.

### 4.3 The distribution of risks and coping mechanism across class categories

This section analyses in greater depth the routes by which individuals and households move into and out of the middle class. Building on the conceptual foundations laid in the vulnerability literature – which, with few exceptions (see, for example, Azomahou and Yitbarek, 2015), is mostly agriculture-oriented and focusses on the occurrence of covariate weather-related shocks (see, e.g., Carter and May, 2001; Dercon, 2006; Klasen and Waibel, 2013; Ward, 2016) – we attempt to identify shocks and insurance mechanisms with particular relevance to inter-class transitions and stability in the South African urban setting.<sup>12</sup>

Our approach closely relates to the method developed by Bane and Ellwood (1986) in an analysis for the United States that has since been used repeatedly to study the determinants of poverty transitions and low income dynamics (see e.g. Jenkins and Schuller, 2003; Jenkins and Rigg 2001). Drawing on Jenkins (2011), we modify the original approach using a non-exhaustive compilation of not mutually exclusive trigger events that may explain middle class entries and exits. These events include variations in the number of employed household members and other sorts of changes in the household composition, changes in labour earnings and non-labour incomes, and changes in the geographic location. In addition, we look into the insurance mechanisms and financial instruments that can be associated with staying in the middle class.

To our knowledge, ours is the first study that uses this approach to provide an assessment of the events that may trigger middle class entries and exits. Through such an analysis, we aim to give an indication of the mechanisms that might improve economic stability in South Africa, with a view to allowing more people to join the ranks of an economically stable middle class. While the analysis of these associations is undoubtedly informative, we are aware that issues such as reverse causation, confounding shocks and simultaneity make identifying causal relations exceptionally difficult. Our aim is thus to provide a first idea of the potential mechanisms at play, and provide an understanding of the kinds of issues that will need to be taken up in further research.

For the correlation exercise presented in this section, we group together the middle class and elite, on the one hand, and the poor and vulnerable, on the other. In the following, for the sake of simplicity, we will use the term “middle class entries” to refer to entries into the middle class or elite from below and “middle class exits” to refer to falls out of the middle class or elite into poverty or vulnerability. All changes will refer to wave-to-wave transitions in the pooled panel dataset using the first four waves of NIDS. This means that, by construction, the analysis considers class transitions over intervals of approximately two years.

The tabulation of middle class entries by event type is shown in Table 11. In total, a share of 7.2 per cent of the individuals who were classified as poor or vulnerable in 2008, 2010, or 2012, entered into the middle class or elite within a two-year time span. This small share is primarily explained by the fact that the chronically poor, who constitute the largest group in the sample, on average had a chance of less than one per cent to move up into the middle class or elite. Middle class entries were considerably more common among the transient poor and the vulnerable (compare section 4.2).

We observe that more than every third middle class entry in our dataset can be associated with a rise in the number of workers present in the household. On average, those households who experienced this trigger event had an average likelihood to move into the middle class of 8.8 per cent, which is slightly higher compared to the unconditional average of 7.2 per cent. Some of these switches arise

---

<sup>12</sup> In South Africa, both subsistence agriculture and the informal sector are very small relative to most countries in the developing world. See Chapter 3, Seekings and Natrass (2005) for a historical account of the ‘deagrarianisation’ of South African society in the 1950s and 1960s.



because a working adult joins the household (or the individual moved to another household with a larger number of working adults) and some arise because existing members find employment. The associated likelihood of entering the middle class is importantly higher in cases where the increase in the number of workers occurs without an accompanying change in the household size. While this conditional event tends to occur less frequently, those households for which we can assume that an existing member found a job on average almost double their chances of making it to the middle class. In addition, increases in labour earnings (by at least 10 per cent), holding the number of workers in the household unchanged, can be related to about one fifth of all middle class entries. By contrast, those who experienced an increase in their non-labour incomes, particularly government grants and remittances, will most likely not middle class entrants. While these increases may play an important role in buffering negative economic shocks and securing the lives of the poor and the vulnerable, they generally do not (and are not intended to) present an avenue into the middle class or elite.

With regard to the household composition, decreases in household size and changes from a female to a male household head are among the most frequently experienced events. Especially the latter tends to be associated with elevated chances to enter the middle class. We may note that there is some overlap between those who see a change in the household head from female to a male and those who see an increase in the number workers. These would be cases in which either an existing male member found employment and took over the headship or a working male joined the household and became the head. While geographic movement from rural to urban areas as well from other provinces of the country to Gauteng or the Western Cape appear much less frequently compared to other trigger events, those who move see their chances of entering the middle class increase considerably. One reason behind this pattern may be that people decide to move because they find new or better paying jobs in these areas.

**Table 11: Events associated with entries into the middle class (or elite), 2008 to 2014/15**

Entries into the middle class (or elite) from below		Number of cases	Weighted Share (%)
Individuals, who were poor or vulnerable to poverty in $t - 1$ :		58,092	
Entries into middle class from below between $t - 1$ and $t$ :		2,813	7.19

Household event type	Event prevalence		Middle class entries conditional on event		Middle class entries associated with event
	Number of cases	Weighted Share (%)	Number of cases	Weighted Share (%)	Weighted Share (%)
<i>Labour market events</i>					
▪ Rise in the number of workers	17,235	31.38	1,011	8.77	38.28
▪ Rise in the number of workers (household size constant)	5,998	11.87	446	13.12	21.68
▪ Rise in labour income ( $\geq 10\%$ ) (number of workers constant)	6,105	11.32	566	12.06	18.99
<i>Non-labour income events</i>					
▪ Rise in income from public grants ( $\geq 10\%$ )	4,796	7.85	88	1.44	1.57
▪ Rise in income from remittances ( $\geq 10\%$ )	285	0.56	8	3.78	0.30
<i>Demographic events</i>					
▪ Change in the household head (from female to male)	7,134	12.95	846	16.95	30.54
▪ Decrease in the household size	18,146	28.96	1,255	9.31	37.52
▪ Movement from rural to urban area	1,746	2.49	256	17.41	6.03
▪ Movement to Gauteng or Western Cape from other provinces	796	1.26	168	23.20	4.07

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

Mirroring the analysis of the potential determinants of middle class entry, in Table 12 we report the correlations between middle class exits and specified trigger events. We observe that 30.1 per cent of all middle class exits are associated with a fall in the number of workers present in the household. Holding the household size constant, we interestingly see a somewhat lower association of 27.3 per cent. This suggests that the correlation observed between a reduction in the number of working household members and falls out of the middle class is driven disproportionately by cases in which the event is accompanied by an increase in household size – in which case the average risk to exit the middle class rises to 64.7 per cent. We could imagine this to be partly explained by cases in which people retire from work and see other family members join their household. By contrast, cuts in labour earnings (by at least 10 per cent), while holding the number of workers unchanged, do not seem to be a driving force behind exits out of the middle class. Similarly, we also cannot relate the observed middle class exits to a decline in non-labour income sources.

In terms of demographic trigger events, changes from a male to a female household head can be associated with about every third middle class exit. This event often coincides with the loss of an adult working household member. Overall, 20.2 per cent of all middle class (or elite) households experienced an increase in household size and, of those who did, almost every third household fell into poverty or vulnerability. It is worth noting that this effect would be more moderate if adult equivalence scales were used in measuring poverty instead of a per capita poverty measure. Despite the negative association between household size and risk to poverty, the death of a household member can trigger a fall out of the middle class, especially when the deceased household member brought in income in the form of labour earnings. However, life insurance can help to moderate this negative shock.

**Table 12: Events associated with exits out of the middle class (or elite), 2008 to 2014/15**

<b>Exits out of the middle class (or elite) into poverty or vulnerability</b>		<b>Number of cases</b>	<b>Weighted Share (%)</b>		
Individuals, who were middle class (or elite) in $t - 1$ :		7,111			
Exits out of the middle class (or elite) between $t - 1$ and $t$ :		1,685	18.63		
<b>Household event type</b>	<b>Event prevalence</b>		<b>Middle class exit conditional on event</b>		<b>Middle class exit associated with event</b>
	<b>Number of cases</b>	<b>Weighted Share (%)</b>	<b>Number of cases</b>	<b>Weighted Share (%)</b>	<b>Weighted Share (%)</b>
<i>Labour market events</i>					
▪ Fall in the number of workers	1,622	21.26	579	30.77	35.11
▪ Fall in the number of workers (household size constant)	698	9.13	185	27.30	13.38
▪ Fall in labour income ( $\geq 10\%$ ) (number of workers constant)	1,134	17.42	245	17.21	16.09
<i>Non-labour income events</i>					
▪ Fall in income from public grants ( $\geq 10\%$ )	61	0.26	33	19.23	0.27
▪ Death of a non-resident family member, who assisted financially	261	3.40	74	14.99	2.74
<i>Demographic events</i>					
▪ Change in household head (from male to female)	1,218	17.31	546	35.88	33.32
▪ Increase in the household size	1,649	20.23	704	35.03	38.03
▪ Birth of a child (0 to 2 years)	981	12.32	460	43.20	28.56
▪ Death of a household member	320	3.88	118	35.28	7.35
▪ Death of a household member (with life insurance)	138	1.89	33	27.33	2.76

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

Finally, the association between the chances of staying in the middle class and the possession of selected insurance mechanisms and credit instruments is reported in Table 13. Among the formal insurance mechanisms, health and life insurance is widely used and can be respectively related to 41.9 and 44.5 per cent of the cases where individuals stayed in the middle class. Individuals in possession of a private pension, retirement annuity, unit trusts, stocks and/or shares also have above average chances of staying in the middle class. Regarding ex-post consumption smoothing strategies, personal loans from banks are the most frequently used instrument. Having access to a bank loan importantly increases the chances of staying in the middle class. However, access to these financial services is limited to a relatively small portion of the population, mostly concentrated amongst the elite and upper end of the middle class. The observed higher financial stability among this group may thus simply reflect their rather elevated economic standing and is not necessarily a direct outcome of the possession of financial assets and insurance mechanisms

In contrast, belonging to a Stokvel or savings club appears insufficient to buffer larger economic shocks and does not relate to a higher likelihood of staying in the middle class. Also informal loans from family members or friends appear insufficient to keep someone in the middle class. These instruments, however, tend to be concentrated amongst the lower middle class and may thus primarily reflect the already compromised economic position of this group. Unfortunately, we did not observe sufficient cases to give an indication of the stabilizing effect which loans from micro-lenders or from informal money lenders could have. Also asset sales, which may offer a potential coping strategy for households without access to financial markets, were barely observed in the data at hand. Clearly, more work will need to be done in investigating the effectiveness of various formal and informal risk coping mechanisms in South Africa. The existing quantitative data, however, is ill-suited to answering these more complex questions, especially for those informal coping strategies which are the main form of insurance amongst the lower social classes. There is significant scope for further research - both quantitative and qualitative – in identifying what kinds of coping mechanisms are being used, and which of these have the scope to be strengthened and improved to improve the economic security of those who fall outside of the stable middle class.

**Table 13: Instruments associated with staying in the middle class (or elite), 2008 to 2014/15**

<b>Exits out of the middle class (or elite) into poverty or vulnerability</b>		<b>Number of cases</b>	<b>Weighted Share (%)</b>		
Individuals, who were middle class (or elite) in $t - 1$ :		7,111			
Exits out of the middle class (or elite) between $t - 1$ and $t$ :		5,426	76.30		
<b>Household event type</b>	<b>Event prevalence</b>		<b>Middle class persistence conditional on event</b>		<b>Middle class persistence associated with event</b>
	<b>Number of cases</b>	<b>Weighted Share (%)</b>	<b>Number of cases</b>	<b>Weighted Share (%)</b>	<b>Weighted Share (%)</b>
<i>Insurance mechanisms</i>					
▪ Have a health insurance	2,566	37.66	2,216	90.50	41.89
▪ Have a life insurance	3,025	41.32	2,519	87.55	44.46
▪ Have a pension/retirement annuity	553	9.18	485	92.42	10.43
▪ Have unit trusts, stocks and shares	165	2.79	160	98.84	3.39
▪ Belong to a Stokvel/ Savings Club	248	3.09	186	81.32	3.09
<i>Credit instruments</i>					
▪ Personal loan from bank (in $t$ and not in $t - 1$ )	497	7.12	427	90.45	7.66
▪ Loan from a family member/friend (in $t$ and not in $t - 1$ )	85	1.24	58	76.51	1.29

Source: Author's calculations using NIDS waves 1 to 4 pooled sample (post-stratified weights corrected for panel attrition).

Notes: Insurance mechanisms are identified *ex ante* (in  $t - 1$ ), while credit instruments are identified *ex post* (in  $t$ ).

## 5. Conclusion

This paper aims to contribute to the existing literature on social class in developing countries by investigating social stratification through the lens of poverty dynamics. Conceptually, the proposed class schema takes as its starting point a standard division of society into three broad classes: the poor, the middle class, and the elite – where the poverty line is set as the frontier between the poor and the middle class. That is, as a minimum necessary condition, middle class households should be able to afford a basket of goods considered adequate to satisfy a person's basic needs. However, in a world of risk and uncertainty, being able to afford a certain standard of living today does not yet give a good indication whether the same will be true in the near future. Given that in the sociological class literature the middle class is generally regarded as being an 'empowered' class which is characterised by relative economic security, we propose a more stringent definition of the middle class than the approach which merely assumes that the middle class is 'not poor'. In particular, we attempt to define the middle class as a class which is not vulnerable to becoming poor. Similarly, the experience of poverty is not homogenous, and may be quite different for those who are persistently poor compared to those who stand a good chance of escaping poverty.

Given the classification derived in this paper, we find that only about 20 per cent of the South African population can be considered as stably middle class. While the population share of the middle class remained relatively stable between 2008 and 2014/15, consistent with the existing literature, we find that the share of Africans in the middle class has been expanding. Despite this change in racial composition, Africans are still underrepresented in the middle class compared to their share in the overall population, and race remains a strong predictor of chronic as well as transient poverty and vulnerability to poverty in South Africa. Having access to stable labour market income, by contrast, is a key determinant for achieving economic stability in South Africa. We also find that a higher level of education of the household head and having a working household head (ideally in a white collar occupation) are both strong predictors for lower vulnerability to poverty. Accordingly, we show that the middle class generally derives its status from income generated in the labour market, and depends on this source of income to sustain its lifestyle. However, given the small size of the middle class, we find that at least three in four South Africans have not reached a situation of economic stability and remain either poor or vulnerable to becoming poor.

Our investigation into poverty dynamics further reveals that there is substantial genuine state dependence of poverty. That is, the experience of poverty itself, independent of other household characteristics and resources, increases the chance that initially poor household will remain poor. Yet, our findings also point to a number of potential avenues out of poverty for disadvantaged South Africans. Better access to high quality education, proximity to urban centres which provide economic opportunity, and the presence of an employed member in the household are all factors which show potential to reduce inequality of opportunity and limit the impact of parental socio-economic background in determining poverty persistence. In order to off-set the effects of poverty traps due to genuine state dependence, policy will need to focus on improving access and quality education, easing access to functioning markets in urban centres, and tackling unemployment. We have also shown that life transitions such as the birth of a child or losing one's job importantly increase poverty risks, which opens scope for targeted social protection measures. Yet, these will require a closer investigation into the distribution, frequency and intensity of poverty triggering life events as well as their interrelationship with social class and existing coping mechanism.

## References

- AfDB (2011). *The middle of the pyramid: Dynamics of the middle class in Africa*. AfDB Market Brief, 20 April 2011. Tunis: African Development Bank
- Arthur, J. A. (2014). *Class Formations and Inequality Structures in Contemporary African Migration: Evidence from Ghana*. Lexington Books.
- Azomahou, T. T., & Yitbarek, E. A. (2015). Poverty persistence and informal risk management: Micro evidence from urban Ethiopia. UNU-MERIT Working Paper Series, 2015-006, Maastricht: Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT) & Maastricht Graduate School of Governance (MGSoG).
- Bane, M., & Ellwood, D. (1986). Slipping into and out of poverty: the dynamics of spells. *Journal of Human Resources*, 21(1), 1–23.
- Banerjee, A., & Duflo, E. (2008). What is Middle Class about the Middle Classes around the World? *Journal of Economic Perspectives*, 22(2), 3-28.
- Beck, U. (1992). *Risk Society: Towards a New Modernity*. London: Newbury Park, California: Sage Publications; German 1986.
- Bhalla, S. S. (2007). Second among equals: The middle class kingdoms of India and China. Book draft Chapter 5, available at [www.oxusinvestments.com](http://www.oxusinvestments.com). [20 May 2016]
- Birdsall, N. (2010). *The (Indispensable) Middle Class in Developing Countries; or, The Rich and the Rest, Not the Poor and the Rest*. (Center for Global Development Working Paper 2011/207). Washington D.C.: Center for Global Development.
- Burger, R., McAravey, C., & Van der Berg, S. (2015). *The Capability Threshold: Re-examining the definition of the middle class in an unequal developing country*. (Stellenbosch Economic Working Papers 16/15). Department of Economics, Stellenbosch University.
- Burger, R., Steenekamp, C., Van der Berg, S., & Zoch, A. (2014). *The middle class in post-apartheid South Africa: Examining and comparing rival approaches*. Stellenbosch Economic Working Papers 11/14). Department of Economics, Stellenbosch University.
- Cafiero, C., & Vakis, R. (2006). *Risk and Vulnerability Considerations in Poverty Analysis: Recent Advances and Future Directions*, (Social Protection Discussion Paper 0610). Washington D.C.: The World Bank.
- Cappellari, L., & Jenkins, S. (2002). Who Stays Poor? Who Becomes Poor? Evidence from the British Household Panel Survey. *The Economic Journal*. 112(478), C60—C67.
- Cappellari, L., & Jenkins, S. (2004). Modelling Low Income Transitions. *Journal of Applied Econometrics*. 19(5), 593-610.
- Cappellari, L., & Jenkins, S. P. (2008). Estimating low pay transition probabilities accounting for endogenous selection mechanisms. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 57(2), 165-186.
- Cárdenas, M., Kharas, H., & Henao, C. (2011). Latin America's global middle class. Research Paper, Brookings Institution, Washington, DC.
- Carter, M. R., & May, J. (2001). One kind of freedom: Poverty dynamics in post-apartheid South Africa. *World development*, 29(12), 1987-2006.
- Clark, T.N., & Lipset, S. M. (1991). Are Social Classes Dying?. *International Sociology*, 6 (4), 397-410.

- Crankshaw, O. (1997). *Race, Class and the Changing Division of Labour under Apartheid*. London and New York: Routledge.
- Dercon, S. (2006). *Vulnerability: A micro perspective*. (QEH Working Paper Series, Working Paper No. 149). Oxford: Department of International Development, University of Oxford.
- Di Prete, T. (2002). Life course risks, mobility regimes, and mobility consequences: a comparison of Sweden, Germany, and the United States. *American Journal of Sociology*, 108(2), 267-309.
- Easterly, W. (2001). The middle class consensus and economic development. *Journal of Economic Growth*, 6(4), 317-335.
- Finn, A., Leibbrandt, M., & Woolard, I. (2013). *The Middle Class and Inequality in South Africa* (Southern Africa Labour and Development Research Unit, unpublished paper for the Programme to Support Pro-Poor Policy Development). Cape Town: SALDRU, University of Cape Town.
- Finn, A., & Leibbrandt, M. (2016). The dynamics of poverty in the first four waves of NIDS. Cape Town: Southern Africa Labour and Development Research Unit (SALDRU), University of Cape Town. SALDRU Working Paper Number 174/ NIDS Discussion Paper 2016/1.
- Foster, J., & Wolfson, M. C. (2009). Polarization and the decline of the middle class: Canada and the US. OPHI Working Paper No. 31, University of Oxford, Oxford.
- Garcia-Rivero, C., Du Toit, P., & Kotzé, H. (2003). Tracking the development of the middle class in democratic South Africa. *Politeia*, 22(3), 6-29.
- Giesbert, L., & Schotte, S. (2016). Africa's new middle class: Fact and fiction of its transformative power. *GIGA Focus Africa*, 1.
- Glewwe, P., & Gibson, J. (2006). Analysis of poverty dynamics. *Handbook of Poverty Statistics*, 324-369.
- Goldthorpe, J. H. (1980). *Social Mobility and the Class Structure in Modern Britain* (2nd. ed.). Oxford: Clarendon Press.
- Goldthorpe, J. H. (2000). *On Sociology: Numbers, Narratives, and the Integration of Research and Theory*. Oxford: Oxford University Press.
- Heckman, J. J. (1981a). The incidental parameters problem and the problem of initial conditions in estimating a discrete time-discrete data stochastic process. In Manski CF, McFadden D *Structural Analysis of Discrete Data with Econometric Applications*, (eds). MIT Press: Cambridge, MA.
- Heckman, J. J. (1981b). Statistical models for discrete panel data. In *Structural Analysis of Discrete Data with Econometric Applications*, Manski CF, McFadden D (eds). MIT Press: Cambridge, MA.
- Inglehart, R. (1990). *Culture Shift in Advanced Industrial Society*. Princeton University Press: Princeton, NJ.
- Jalan, J., & Ravallion, M. (1998). Transient poverty in post-reform rural China. *Journal of Comparative Economics*, 26(2), 338-357.
- Jenkins, S., & Rigg, J. (2001). The dynamics of poverty in Britain. Department for Work and Pensions, Research Report 157.
- Jenkins, S. P., & Schluter, C. (2003). Why are child poverty rates higher in Britain than in Germany? A longitudinal perspective. *Journal of Human Resources*, 38(2), 441-465.
- Jenkins, S. (2011). *Changing Fortunes: Income Mobility and Poverty Dynamics in Britain*. Oxford: Oxford University Press.

- Klasen, S., & Waibel, H. (Eds.) (2013). *Vulnerability to Poverty: Theory, measurement and determinants, with case studies from Thailand and Vietnam*. Palgrave Macmillan.
- Levy, B., Hirsch, A., & Woolard, I. (2014). *South Africa's evolving political settlement in comparative perspective*, (Southern Africa Labour and Development Research Unit Working Paper Number 138). Cape Town: SALDRU, University of Cape Town.
- López-Calva, L. F., & Ortiz-Juarez, E. (2014). A vulnerability approach to the definition of the middle class, *The Journal of Economic Inequality*, 12(1), 23-47.
- McEwan, C., Hughes, A., & Bek, D. (2015). Theorising middle class consumption from the global South: A study of everyday ethics in South Africa's Western Cape. *Geoforum*, 67: 233–243.
- McKinsey (2012). *The rise of the African consumer: A report from McKinsey's Africa Consumer Insights Center*, McKinsey Global Institute.
- Phadi, M., & Ceruti, C. (2011). The multiple meanings of the middle class in Soweto, South Africa. *African Sociological Review*, 15(1), 87-107
- Ravallion, M. (2010). The Developing World's Bulging (but Vulnerable) Middle Class, *World Development*, 38(4), 445-454.
- SALDRU (2016a). National Income Dynamics Study 2008, Wave 1 [dataset]. Version 5.3. Cape Town: Southern Africa Labour and Development Research Unit [producer], Cape Town: DataFirst [distributor].
- SALDRU (2016b). National Income Dynamics Study 2010-2011, Wave 2 [dataset]. Version 2.3. Cape Town: Southern Africa Labour and Development Research Unit [producer], Cape Town: DataFirst [distributor].
- SALDRU (2016c). National Income Dynamics Study 2012, Wave 3 [dataset]. Version 1.3. Cape Town: Southern Africa Labour and Development Research Unit [producer], Cape Town: DataFirst [distributor].
- SALDRU (2016d). National Income Dynamics Study 2014-2015, Wave 4 [dataset]. Version 1.0. Cape Town: Southern Africa Labour and Development Research Unit [producer], Cape Town: DataFirst [distributor], Pretoria: Department of Planning Monitoring and Evaluation [commissioner].
- Schotte, S. (2016). Not Middle Class, But Middle Classes: An Assessment for South Africa, Paper prepared for presentation at the International Workshop on Inequality and Middle Class Development in Africa, Cape Town (04–06 May).
- Seekings, J., & Nattrass, N. (2005). *Class, Race and Inequality in South Africa*. New Haven and London: Yale University Press.
- Sen, A. (1993). Capability and well-being. In *The Quality of Life*, M. Nussbaum and A. Sen (eds.), Clarendon Press: Oxford.
- Solimano, A. (2008). The middle class and the development process: International evidence. Santiago, Chile: Economic Commission for Latin America and the Caribbean, ECLAC. Mimeographed document.
- Southall, R. (2016). *The New Black Middle Class in South Africa*. South Africa: Jacana Media.
- StatsSA (2015). *Methodological report on rebasing of national poverty lines and development of pilot provincial poverty lines*. (Technical Report 03-10-11). Pretoria: Statistics South Africa.

- StatsSA (2016). Quarterly Labour Force Survey, Quarter 3: 2016. Available: <http://www.statssa.gov.za/publications/P0211/P02113rdQuarter2016.pdf> [31 January 2017]
- Stewart, M. B., & Swaffield, J. K. (1999). Low pay dynamics and transition probabilities. *Economica*, 66, 23-42.
- Udjo, E. O. (2008). *The demographics of the emerging black middle class in South Africa*. (University of South Africa Bureau of Market Research Reports Paper 375). Pretoria, South Africa: Bureau of Market Research
- Vandecasteele, L. (2015). Social class, life events and poverty risks in comparative European perspective. *International Review of Social Research*, 5(1), 61-74.
- Visagie J. (2013). Is the middle class becoming better off? Two perspectives. *Econ3x3*. Available: <http://www.econ3x3.org/article/middle-class-becoming-better-two-perspectives> [15 February 2016]
- Visagie, J., & Posel, D. (2013). A reconsideration of what and who is middle class in South Africa, *Development Southern Africa*, 30(2), 149-167.
- Ward, P. S. (2016). Transient poverty, poverty dynamics, and vulnerability to poverty: An empirical analysis using a balanced panel from rural China. *World development*, 78, 541-553.
- Weber, M. (1968). *Economy and society : An outline of Interpretative Sociology*. Bedminster Press, New York.
- Zizzamia, R., Schotte, S., Leibbrandt, M., & Ranchhod, V. (2016). Vulnerability and the middle class in South Africa. Cape Town: SALDRU, University of Cape Town. SALDRU Working Paper Number 188/ NIDS Discussion Paper 2016/15.



## Appendix

**Table A1: Multivariate Probit model: Poverty transitions**

<i>Covariate</i>	Stats SA upper bound poverty line			
	Poverty persistence		Poverty entry	
	estimate	s.e.	estimate	s.e.
<i>Characteristics of the head of household (HoH)</i>				
HoH age	0.012***	0.004	-0.025***	0.008
HoH age squared (x0.01)	-0.017***	0.005	0.008	0.009
HoH is female	0.084***	0.025	0.320***	0.041
HoH years of education	-0.039***	0.004	-0.093***	0.008
HoH race group (base: African)				
Coloured	-0.009	0.047	-0.461***	0.07
Asian/Indian	-1.514***	0.167	-1.133***	0.105
White	-1.223***	0.336	-1.231***	0.094
HoH employment (base: inactive)				
Unemployed (discouraged)	0.066	0.06	0.089	0.111
Unemployed (strict)	0.019	0.041	0.168**	0.082
Managers, professionals and technicians	-0.218***	0.081	-0.236***	0.082
Clerical, service and sales occupations	-0.114**	0.057	-0.047	0.072
Craft and trade workers, supervisors	0.149**	0.074	-0.189*	0.111
Plant and machine operators	-0.101	0.07	-0.049	0.095
Elementary occupations	-0.042	0.043	0.083	0.075
Other	0.071*	0.039	0.180***	0.066
<i>Characteristics of the household (HH)</i>				
No. of workers in HH	-0.074***	0.013	-0.061***	0.022
Age composition				
No. of children aged 0-2 in HH	0.146***	0.018	0.323***	0.045
No. of children aged 3-4 in HH	0.184***	0.021	0.285***	0.052
No. of children aged 5-11 in HH	0.144***	0.011	0.172***	0.026
No. of children aged 12-15 in HH	0.133***	0.015	0.192***	0.032
No. of children aged 16-18 in HH	0.095***	0.017	0.087**	0.038
No. of elderly aged 60-75 in HH	-0.003	0.021	0.179***	0.039
No. of elderly aged 75 plus in HH	0.065	0.047	0.241***	0.084
Geographic location (base: traditional)				
Urban	-0.088***	0.028	-0.163***	0.05
Farms	0.110**	0.054	0.218***	0.079
Province fixed effects (base: Western Cape)				
Eastern Cape	0.206***	0.05	-0.240***	0.074
Northern Cape	0.02	0.047	-0.175**	0.085
Free State	0.155***	0.055	-0.540***	0.08
KwaZulu-Natal	0.310***	0.05	0.009	0.073
North West	0.091	0.056	-0.185*	0.105
Gauteng	0.094*	0.053	-0.369***	0.07
Mpumalanga	0.185***	0.055	-0.319***	0.077
Limpopo	0.084	0.056	-0.249***	0.084
<i>Time fixed effects</i>				
Wave 3	-0.115***	0.031	-0.164***	0.049
Wave 4	-0.415***	0.029	-0.425***	0.044
Constant	0.798***	0.127	1.344***	0.217
Log-likelihood		-104,800,000		
Model chi2 (d.f. = 162)		20,439		
Number of observations		67,624		

Robust standard errors clustered at the individual level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on pooled transitions from NIDS waves 1 to 4.

**Table A2: Multivariate Probit model: Initial Poverty Status**

<i>Covariate</i>	estimate	s.e.
<i>Characteristics of the individual</i>		
Mother education (base: no schooling)		
0-7 years	0.156***	0.053
8-11 years	0.177**	0.076
matric +	0.304***	0.087
Don't know	0.059	0.052
Missing	-0.096	0.091
Father education (base: no schooling)		
0-7 years	0.121**	0.056
8-11 years	-0.08	0.081
matric +	0.344***	0.075
Don't know	-0.022	0.043
Missing	-0.06	0.066
Kind of work usually done by mother (base: never worked)		
Elementary	-0.014	0.043
Non-Elementary	0.215***	0.068
Don't know	-0.007	0.071
Missing	0.009	0.085
Kind of work usually done by father (base: never worked)		
Elementary	0.224***	0.053
Non-Elementary	0.283***	0.048
Don't know	0.118***	0.045
Missing	0.294***	0.06
<i>Characteristics of the head of household (HoH)</i>		
HoH age	-0.008*	0.004
HoH age squared (x0.01)	0.021***	0.004
HoH is female	-0.192***	0.024
HoH years of education	0.097***	0.004
HoH race group (base: African)		
Coloured	0.382***	0.049
Asian/Indian	1.781***	0.125
White	1.368***	0.165
HoH employment (base: inactive)		
Unemployed (discouraged)	0.096	0.068
Unemployed (strict)	-0.076*	0.04
Managers, professionals and technicians	1.119***	0.051
Clerical, service and sales occupations	0.512***	0.046
Craft and trade workers, supervisors	0.471***	0.057
Plant and machine operators	0.193**	0.08
Elementary occupations	0.132***	0.043
Other	0.099***	0.036
<i>Characteristics of the household (HH)</i>		
No. of workers in HH	0.077***	0.013
Age composition		
No. of children aged 0-2 in HH	-0.323***	0.018
No. of children aged 3-4 in HH	-0.385***	0.021
No. of children aged 5-11 in HH	-0.280***	0.013
No. of children aged 12-15 in HH	-0.185***	0.016
No. of children aged 16-18 in HH	-0.252***	0.021
No. of elderly aged 60-75 in HH	-0.017	0.023
No. of elderly aged 75 plus in HH	-0.260***	0.046

Geographic location (base: traditional)		
Urban	0.273***	0.029
Farms	-0.095*	0.055
Province fixed effects (base: Western Cape)		
Eastern Cape	-0.106**	0.049
Northern Cape	-0.025	0.046
Free State	0.136**	0.056
KwaZulu-Natal	0.001	0.049
North West	0.129**	0.055
Gauteng	0.233***	0.054
Mpumalanga	0.112**	0.054
Limpopo	0.042	0.056
<i>Year fixed effects</i>		
2012 (wave 3)	-0.047*	0.027
2014 (wave 4)	-0.079***	0.024
Constant	0.008	0.007
Model chi2 (d.f. = 162)		20,439
Number of observations		67,624

Robust standard errors clustered at the individual level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on pooled transitions from NIDS waves 1 to 4.

**Table A3: Multivariate Probit model: Panel retention**

<i>Covariate</i>	estimate	s.e.
<i>Characteristics of the individual</i>		
Cooperative during interview	0.488***	0.04
Original sample member	0.991***	0.048
<i>Characteristics of the head of household (HoH)</i>		
HoH age	-0.016**	0.008
HoH age squared (x0.01)	0.008	0.007
HoH is female	-0.047	0.035
HoH years of education	-0.007	0.006
HoH race group (base: African)		
Coloured	-0.170**	0.084
Asian/Indian	-0.286*	0.15
White	0.191*	0.111
HoH employment (base: inactive)		
Unemployed (discouraged)	0.283***	0.094
Unemployed (strict)	-0.068	0.068
Managers, professionals and technicians	-0.150*	0.089
Clerical, service and sales occupations	-0.049	0.086
Craft and trade workers, supervisors	0.220**	0.106
Plant and machine operators	-0.007	0.174
Elementary occupations	-0.066	0.075
Other	-0.125**	0.052
<i>Characteristics of the household (HH)</i>		
No. of workers in HH	0.046**	0.019
Age composition		
No. of children aged 0-2 in HH	0.111***	0.026
No. of children aged 3-4 in HH	0.090***	0.029
No. of children aged 5-11 in HH	0.065***	0.017
No. of children aged 12-15 in HH	-0.013	0.024
No. of children aged 16-18 in HH	-0.071***	0.025
No. of elderly aged 60-75 in HH	-0.087**	0.036
No. of elderly aged 75 plus in HH	-0.109	0.067
Geographic location (base: traditional)		
Urban	-0.191***	0.05
Farms	0.082	0.094
Province fixed effects (base: Western Cape)		
Eastern Cape	0.319***	0.086
Northern Cape	0.190**	0.08
Free State	0.317***	0.093
KwaZulu-Natal	0.317***	0.087
North West	0.365***	0.094
Gauteng	0.146*	0.088
Mpumalanga	0.284***	0.094
Limpopo	0.504***	0.092
<i>Time fixed effects</i>		
Wave 3	0.520***	0.039
Wave 4	0.653***	0.05
Constant	0.961***	0.224
Model chi2 (d.f. = 162)	20,439	
Number of observations	67,624	

Robust standard errors clustered at the individual level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on pooled transitions from NIDS waves 1 to 4.

**Table A4: Dynamic model of (logarithmised) per capita household expenditure with random effects**

<i>Covariate</i>	estimate	s.e.
Ln (per capita household expenditure in previous period)*	0.398***	0.02
<i>Characteristics of the head of household (HoH)</i>		
HoH age	-0.008***	0.001
HoH age squared (x0.01)	0.010***	0.001
HoH is female	-0.050***	0.006
HoH years of education	0.032***	0.001
HoH race group (base: African)		
Coloured	0.037***	0.012
Asian/Indian	0.486***	0.036
White	0.731***	0.036
HoH employment (base: inactive)		
Unemployed (discouraged)	-0.023	0.017
Unemployed (strict)	-0.040***	0.01
Managers, professionals and technicians	0.526***	0.017
Clerical, service and sales occupations	0.254***	0.013
Craft and trade workers, supervisors	0.217***	0.018
Plant and machine operators	0.300***	0.017
Elementary occupations	0.066***	0.01
Other	0.117***	0.009
<i>Characteristics of the household (HH)</i>		
No. of workers in HH	0.036***	0.003
Age composition		
No. of children aged 0-2 in HH	-0.153***	0.004
No. of children aged 3-4 in HH	-0.116***	0.005
No. of children aged 5-11 in HH	-0.101***	0.003
No. of children aged 12-15 in HH	-0.083***	0.004
No. of children aged 16-18 in HH	-0.098***	0.005
No. of elderly aged 60-75 in HH	0.010*	0.005
No. of elderly aged 75 plus in HH	-0.024**	0.01
Geographic location (base: traditional)		
Urban	0.111***	0.008
Farms	-0.035***	0.012
Province fixed effects (base: Western Cape)		
Eastern Cape	-0.041***	0.013
Northern Cape	-0.025*	0.013
Free State	0.029*	0.016
KwaZulu-Natal	-0.045***	0.013
North West	-0.017	0.015
Gauteng	0.091***	0.014
Mpumalanga	-0.049***	0.015
Limpopo	-0.025*	0.015
<i>Time fixed effects</i>		
Wave 3	0.074***	0.007
Wave 4	0.200***	0.007
Constant	3.833***	0.109
Sigma_u	0.1015	
Sigma_e	0.5635	
Rho (fraction of variance due to u_i)	0.0315	
Number of observations	71,042	

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on pooled transitions from NIDS waves 1 to 4.

\*Note: Ln (per capita household expenditure in previous period) is instrumented using parental background indicators.